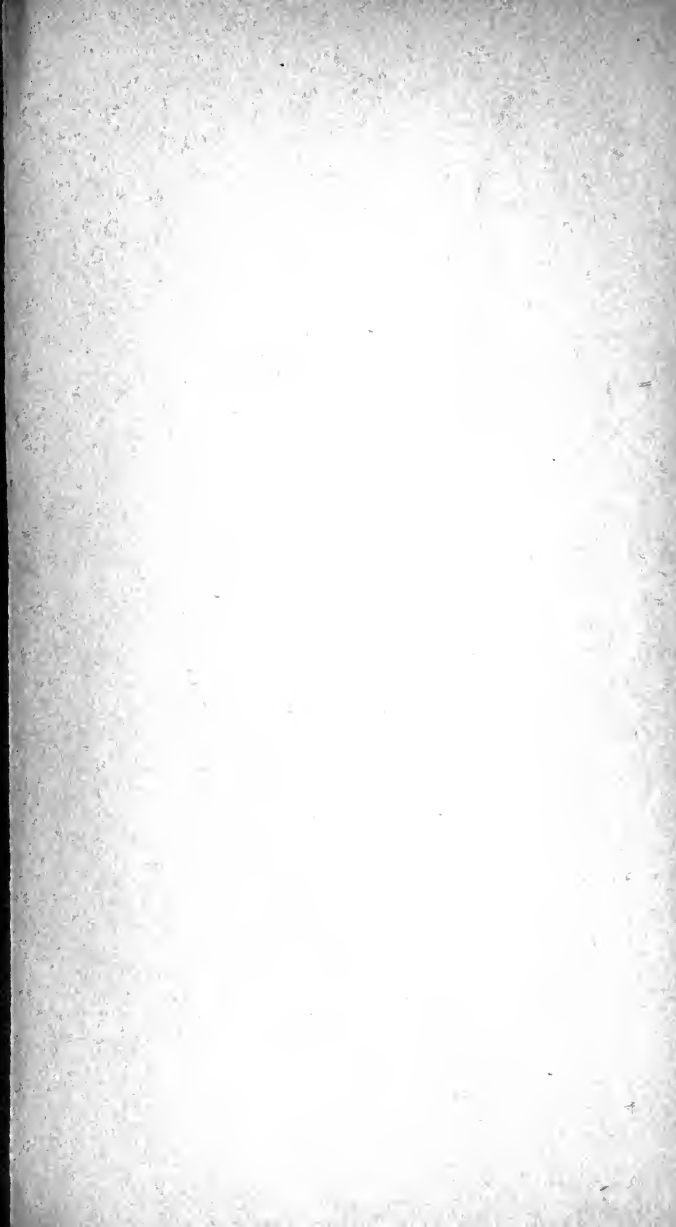






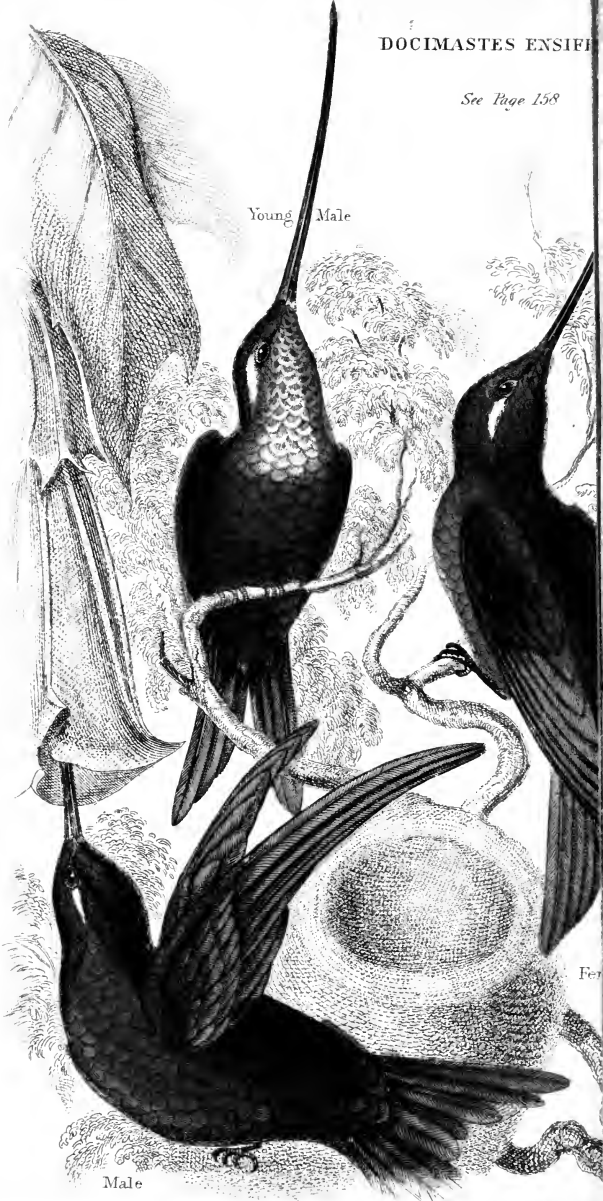
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See Page 158

Young Male



Male



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A

GENERAL HISTORY

OF

H U M M I N G - B I R D S ,

OR THE

TROCHILIDÆ:

WITH ESPECIAL REFERENCE TO THE

COLLECTION OF J. GOULD, F.R.S. &c.

NOW EXHIBITING IN THE

GARDENS OF THE ZOOLOGICAL SOCIETY OF LONDON.

BY

W. C. L. MARTIN,

LATE ONE OF THE SCIENTIFIC OFFICERS OF THE ZOOLOGICAL
SOCIETY OF LONDON.



LONDON:

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PREFACE.

THE science of Zoology, which long had to struggle against indifference and neglect, is now actively cultivated by the most eminent in learning and station; while at the same time its address to popular feeling is responded to with genuine cordiality. How crowded with interested visitors are the Zoological galleries of the British Museum! How crowded are the gardens of the Zoological Society of London, and there, how attractive is Mr. Gould's magnificent Cabinet of Humming-Birds!

So little of these brilliant miniatures of the feathered race is known, in a general and popular sense, that the author of the following pages conceived the idea of a work bearing upon their history,—a work at once popular in style and scientific in detail, which he trusted would meet with acceptance. How far he has succeeded the public will judge. To Mr. Gould, whose Cabinet was freely thrown open to him, and whose magnificent Monograph of the

"TROCHILIDÆ" is now in course of publication, the thanks of the writer are especially due; nor does he forget the deep obligations he owes to the Prince of Canino, from whom he has received, as a personal present, his elaborate "CONSPECTUS," without consulting which, his labours, in the composition of the following pages, would have been far more considerable.

In conclusion, the author cannot here omit an express notice of the two volumes on HUMMING-BIRDS, by Sir W. Jardine, forming part of the "NATURALIST'S LIBRARY," a publication of great ability and felicity of execution. To the HUMMING-BIRDS of this "LIBRARY" he has made abundant references, but has refrained, (excepting in one instance), from re-describing species, the characters of which are so succinctly, but so definitely portrayed. In one or two instances, he has endeavoured to clear up an obscurity, attributable to the limited information till very recently possessed, respecting differences resulting from sex and age.

To this work the author has adapted the following volume, purposely designing to render it a sort of successor; the only difference being this, that the genera are collected into unity, according to the system of the Prince of Canino,

and are illustrated by the most typical forms contained in Mr. Gould's Cabinet;—but where these forms have been previously described in the "HUMMING-BIRDS" of the "NATURALIST'S LIBRARY," a reference to them only is given, and thus the writer avoids infringing upon a work of great utility, and at the same time, so to speak, incorporates his own with it, as (he trusts) a not unworthy sequel.

That much remains to be added to this volume is readily conceded, but if it prove the *nucleus* around which fresh matter may from time to time be accumulated, the author's aim will be accomplished.



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A GENERAL HISTORY

OF THE

HUMMING BIRDS, OR TROCHILIDÆ.

PRELIMINARY OBSERVATIONS.

THE modest volume which we here offer to the public, owes its origin to the superb cabinet of Humming Birds, in the possession of J. Gould, F.R.S., and now exhibited in the Gardens of the Zoological Society of London, Regent's Park. This collection, unrivalled in Europe, and displayed to the utmost advantage, contains about three hundred distinct species, of which many are yet undescribed, and to which others will from time to time undoubtedly be added.

There is, perhaps, no group of birds less thoroughly understood than the Trochilidæ, or of which the component parts have been acquired by the European ornithologist more slowly, or with greater difficulty.

That a very few species only should have been known to Linnæus will not surprise us: but long after the time of the great Swedish systematist, the number of recorded species was

very limited. Lesson, in his General Index, enumerates only one hundred and ten species, and of these some are spurious. In 1824, Mr Bullock (in his work entitled "Six Months in Mexico") states that only one hundred species were in his collection, but that every day added to the number.

The cabinet of the late Mr. George Loddige contains nearly two hundred species, and was heretofore the first in Europe. This gentleman enjoyed peculiar advantages for the formation of a collection of these birds, through the agency of employés in those regions of the New World, where the flowers and the birds strive to outvie each other in beauty and singularity.

The collection of Mr. Gould (1852) contains, as we have said, three hundred species, and before the expiration of a twelvemonth, will, in consequence of the energetic measures taken by this celebrated ornithologist, be surprisingly increased by novel additions. We say novel additions,—and we are justified in saying so,—for if we look back over the last seven or eight years, with reference to the number of new species added within that time to Lesson's list, we have every right to predict, now that increased and enthusiastic attention is directed to this fascinating group, that many, many more species which have hitherto escaped observation, will be continually added to the cabinets of Europe, especially to that great cabinet which is now at-

tracting the admiration of the ornithologists of our island and of the adjacent continent.

We are further justified in our prediction, by a consideration of the fact, that, as our discoveries or territorial explorations in the New World advance, so do new Trochilidæ, local in their habitat, remote and isolated, restricted to certain circumscribed spots, arrest, from time to time, the eye of the traveller; and of these, specimens not procured without difficulty, one after another, find their way to Europe; often, indeed, as waifs and strays stranded on the coast, or as curiosities of whose value the possessor is ignorant. But now that attention is directed to these birds, greater will be the influx, and with more purpose the object of their transmission. A definite value is now attached to them, and a new species will command far more than its weight in gold.

Besides, we are now only beginning to study the history, to contemplate the manifold forms of the Humming Birds; as yet the minor groups into which they resolve themselves, and the genera constituting those groups, are all vague, indefinite, and in confusion; yet three hundred species are counted up; but the ornithologist well knows that other forms, for which he is waiting, must arrive, before the history of the Trochilidæ can be modelled into a harmonious consistency. Every attempt, however, is a step in the right direction; but completion is at pre-

sent out of the question. Lesson and Swainson would now be constrained to remodel their arrangements—to reconstruct their divisions.

Since the time of Linnæus, who, as we have intimated, was acquainted with a few species only, few years, comparatively speaking, have passed; and now three hundred species form Mr. Gould's cabinet. Here we appear to contradict our statement, that our knowledge of the Trochilidæ has been slowly acquired. But we reiterate our assertion. There is not a bird, belong to what order or genus it may, pertaining to Europe, or to continental Asia, or even to Africa (the exceptions being limited as to number), which is not known and described. Even the great mass of the birds of Australia have been splendidly figured, and thereby introduced not only into the scientific world, but into the world of popular intelligence. But who knows anything relative to the Humming Birds of America? The total number of the birds of Europe, of every order or group, amounts to no more than 503 species, and of these 100 are common also to America. Three hundred species of Trochilidæ are now collected together in one cabinet, and from this number, nearly equalling that of the whole of the birds of Europe, a number extraordinary as it is, we deduce a conclusion that not more than two-thirds of the species have as yet been registered in the pages of science; for, as we have observed, a purposed

plan of discovery, as far as these birds are concerned, has never yet been put into practice. And, moreover, when we find birds, or species of a given group or family, very numerous, precise research for species not being called into aid, we may reasonably expect, such research being called into aid, that a reduplication of species will be elicited. Thus, then, although three hundred species are now cabinet-contained, our knowledge of the group is very far from being complete. Hence, therefore, we are slow in obtaining a full grasp of the subject, and years may pass over before that grasp is ample.

Three hundred species!—what single group of birds can compete numerically with that of the Trochilidæ! Is this group a family, or is it an order? The structural peculiarities which these birds display might justify us in considering it as entitled to the rank of an order; although Linnæus placed it at the end of his order Picæ, an order embracing the parrots, the toucans, the hornbills, the crows, the rollers, the orioles, the birds of paradise, the trogons, the barbets, the cuckoos, the woodpeckers, the nuthatch, the todies, the kingfishers, the bee-eaters, the hoopoes, the creepers, and others—a most discordant assemblage. Nor was he less unfortunate in the name he selected for the genus, as he regarded it, comprising the few species of Humming-birds with which he was acquainted. The word Trochilus (τροχίλος) is used by Aris-

totle as the appellation of two distinct birds, both of them European and Asiatic species. In the eleventh chapter of the ninth book (Hist. Anim.), the Trochilus is termed Presbys (πρέσβυς), and Basileus (βασιλεύς), the senator and king; and from its description, it was either the common wren, as Belon supposes, or as Ray thinks, the golden-crested wren; but the point is immaterial. The other Trochilus of Aristotle was a bird haunting the borders of rivers, and a favourite with the crocodile, into whose mouth it was accustomed to enter with impunity, in quest of insects or leeches which may have attached themselves to the gums. It is apparently to this bird that Herodotus (Enterpe) alludes in the following passage:—"The crocodile is blind in the water (an error), but very quick-sighted on land; and because he lives for the most part in the river, his mouth is generally infested with *leeches* (βδελλαι from βδελλω, to suck, sucking creatures—query, some sort of insect?) so that, although other beasts and birds equally avoid him, yet he lives in peace with the Trochilus, because he receives a beneficial service from that bird. For when the crocodile goes out of the water and opens his mouth, which he does most commonly towards the south, the Trochilus enters and devours the leeches, for which good office the crocodile is so well pleased that he never hurts him." This bird, according to Geoffrey St. Hilaire, is most

probably the sag-sag of the Arabs, a species of plover, or dotterel, allied to our ringed plover (*Charadrius Hiaticula* of Linnæus), or to the *Ægialites minor* of Bonaparte (*Charadrius minor* of Meyer).

At all events, it must be evident that the name of *Trochilus*, as applied to the Humming-birds, is ill chosen: nevertheless, it has been adopted by modern zoologists, and has become, as it were, so firmly established, that to change it as a family title would lead only to confusion. After all, what is there in a name?

Passing from Linnæus to Cuvier, we find the Humming-birds placed in the "Règne animal" (Ed. 1829), under the great order Passereaux, between the Sun-birds (*Cinnyris*) and the Hoopoes (*Upupa L.*). Cuvier makes short work with them, and divides them into two sections—*Les Colibris* and *Les Oiseaux-mouches*; his preliminary observations, however, are very graphic, although succinct: "These little birds (he writes), so celebrated for the metallic splendour of their plumage, and especially for the discs (plaques) as brilliant as the precious gems, which are formed on the throat or head by means of scale-like feathers of a peculiar structure, have a long and slender beak, enclosing a tongue capable of extension, almost like that of the woodpecker's, by means of an analogous mechanism. This tongue is divided almost from its base into two filaments, which the bird

uses, as is said, to suck up the nectar of flowers ; nevertheless, the Humming-birds live also on small insects, of which we have found the stomach full. Their very small feet, their ample tail, their wings excessively long and narrow, from the rapid abbreviation of the quill-feathers in succession, their short humerus, their extremely large sternum, without a notch, constitute an apparatus of flight very closely resembling that of the swifts. The Humming-birds are moreover capable of balancing themselves in the air (that is, of remaining stationary while on the wing) almost as easily as certain kinds of flies. It is thus that they buz around plants or shrubs in blossom, and they fly more rapidly in proportion than any other bird. Their gizzard is very small, and the intestinal canal is destitute of a cæcal appendage, in which respect they approximate to the woodpeckers. They live isolated, defend their nests with courage, and fight desperately with each other."

Cuvier then observes that to the species which have the beak arched, is given the exclusive title of Colibris *Trochilus* Lacépède; while those which have the beak straight are termed Oiseaux-mouches, or Fly-birds, *Orthorhynchus* Lacépède.

This is the arrangement also of Lesson in his Manuel, but not in his work "Les Trochilidées, ou Les Colibris et les Oiseaux-mouches," where he divides them into twenty-seven races, or small groups, to which the following general zoological characters apply :—

Bill longer than the head, sometimes very long; straight, or bent upwards, or arched more or less downwards. The lower mandible enters within the upper, dilating a little (sometimes not at all) towards the point, and equalling the upper mandible in length. Edges of both mandibles sometimes denticulated, or serrated, near the tip.

Nostrils basal; very small; covered by the advanced feathers of the forehead; placed in a lateral fosset; separated by a slight ridge.

Wings with the quill feathers graduated; the first the longest, and so on in succession; shafts strong and elastic; sometimes dilated at the base.

Tail composed of ten feathers; very variable in length and form. In certain species the tail has been said to consist only of six feathers, but this is a mistake, arising from the minuteness of the four central feathers, which are altogether obscured by the tail coverts.

Tarsi short, delicate, naked, or plumose; having in front three nearly equal toes; the two internal ones a little connected at their base, the hind toe rather stout; all furnished with compressed hooked claws, which are rather robust in proportion to the toes.

Tongue long, extensible; divided at the summit into two (tubular) filaments, or rolled up filaments, and supported by very long branches of the *os hyoides* passing round the back of the skull, acting after the manner of a spiral spring.

Plumage.—That of the male, as a rule, extremely brilliant and sumptuous, glittering with metallic effulgence, and reflecting varying tints in different lights. The plumage of the female is nearly always more sombre, and seldom displays any great extent of metallic lustre. The young males resemble the females.

Food.—Various insects, such as minute Coleoptera, gnats, tipulæ, spiders, together with the pollen and honey of flowers.

Geographical Distribution.—America; principally, but not exclusively, between the tropics and in the adjacent islands.

Mr. Vigors, in his paper on the "*Natural Affinities that connect the Orders and Families of Birds*," in the *Linn. Trans.*, vol. xiv., considers the Sun-birds of Africa and India, or *Cinnyridæ*, and the *Trochilidæ*, as constituting the *normal group* of the *Tenuirostres*, or Suctorial Birds, and, consequently, as being intimately related to each other. And by way of distinction, compared with the *aberrant group* of the Suctorial Birds, (viz. *Promeropidæ*, *Meliphagidæ*, and *Nectariniadæ*,) he observes that these two families never hop from flower to flower, nor employ the feet in climbing; but, on the contrary, make no use of the foot while extracting their food from the blossoms; and, that during the process of feeding, are poised entirely on the wing. These two normal families, he adds, approach each other in the slenderness of their

bill, and the habit of hovering on the wing when they feed. They are chiefly separated by the comparatively stronger bill and foot of the *Cinnyridæ*; but the geographical distribution of the two families points out a line of demarcation.

Cuvier places the Sun-birds under his great group Grimpereaux (*Certhia* Linn.), while he makes the Humming-birds (*Trochilus* Linn.) a distinct group; yet he approximates these groups, and evidently considers them, if not closely related, at least as representatives of each other. Speaking of the Sun-birds, he says, —“ Their beak long and very slender, has the edge of its two mandibles finely serrated: their tongue, which is extensible beyond the beak, terminates in a slight fork. These are small birds, the males of which glitter in the season of love with metallic colouring, and almost rival the effulgence of the Humming-birds, which they represent, as far as this goes (*à cet égard*), in the old world. They are found principally in Africa and the Indian Archipelago. They live on flowers, the nectar of which they suck up. They are active and lively, and their song is pleasing. From their beauty they are in great request for our cabinets; but the plumage of the females, and that of the males, being in the dull season very different from what it is in its brilliancy (in the love season), the discrimination of the species is rendered thereby no easy matter.” It is a point not yet fully deter-

mined, as to whether the gorgeous plumage of the males of the Humming-birds is characteristic of the season of love, or whether, being once attained, it is permanent. Though some naturalists consider this plumage transient, we confess that this is not our opinion. No doubt it becomes dulled by tear and wear in the course of the season; but a new moult will bring a renewal of the same feathers with which the bird was previously invested. Some of the most splendid Humming-birds live habitually high in the Cordilleras, along the border-line of the eternal snow; and though they may, during a certain part of the year, descend to a somewhat lower altitude, we do not hear that their plumage undergoes any change. The extensive collection of Mr. Gould, containing an amount of many hundred specimens, leading us to infer that they were procured at all seasons of the year, presents us not with a single adult male, in anything like undress. Neither does Mr. Bullock, nor Prince Maximilien de Neu-Wied, nor other travellers, describe any change of plumage analogous to that which is so remarkable in many of our European birds. One species we may here instance, namely, King's Humming-bird, *MELLISUGA KINGII*, which, Mr. Darwin observes, is found over a space of 2500 miles on the west coast, from the hot dry country of Lima to the forests of Tierra del Fuego; this species was observed by Captain Philip King, R.N., in the latter

country, near the Straits of Magellan, sporting about in a most exposed place, "during the falling of a snow shower, a proof of the hardy character of this little bird, which, if it does not migrate on the approach of winter to another climate, lingers at least as long as it possibly can. This was the middle of April; the winter had, in fact, already commenced, and all the mountains around us were clothed with snow, while the ground was also coated with the same dazzling covering." This species was, at that time, in its full plumage. (*Zool. Journ.* vol. iii. p. 432.)

But to return. Mr. Swainson, in his *Classification of Birds*, regards the *Trochilidæ* as exhibiting the full development of the suctional perfection belonging to the *Tenuirostres*. The bill, he observes, appears, from its soft (query soft?) and delicate structure, to be adapted for no other purpose than to protect a long bifid and flattened tongue, darted by the bird into the nectary of flowers, for the purpose of licking the honey, admitting, however, that the Humming-birds are partially insectivorous. He contends that there is obviously a strong affinity between the Humming-birds and the *Cinnyridæ* or Sun-birds, although the precise link which connects the two groups is not very palpable. At the same time, he admits their distinction; a point not unfrequently overlooked by the older writers on ornithology.

Mr. Swainson, after these and other remarks, proceeds as follows: "The *Cinnyridæ* have full-sized legs; and their wings are moderate and rounded: the Humming-birds, on the contrary, have the feet excessively short and small, while the wings, for the size of the body, are frequently longer than those of the swallows. As the Sun-birds are restricted to the tropical latitudes of Africa and India, so are the Humming-birds confined to America: both groups are rich in species; and of this, in particular, the variety of secondary forms is almost innumerable. We have endeavoured to determine the five principal genera (in accordance with the fanciful quinary system, now obsolete); but the subgenera can only be correctly ascertained by a much more rigid analysis than we have yet been able to make (an analysis which will require some years before it is properly worked out). In the genus *TROCHILUS*, as now restricted, we have all those whose bills are perfectly straight, the tail being either even or slightly devaricated. *CYNANTHUS* comprehends such species as have the bill slightly bent, with a tail very long and deeply forked. If we look to the Sun-birds on the one hand, and the Hoopoes on the other, we immediately perceive that the straightness of bill is a typical perfection of the Humming-birds (this we query). In the genus *LAMPORNIS* (example, *MANGO HUMMING-BIRD* — *Naturalist's Libr.* vol. ii. p. 100), the bill is ob-

viously much depressed at the base, and the tail is broad and even; while the type of the genus *CAMPYLOPTERUS* (example, BLUE-THROATED SABRE-WING—*Naturalist's Libr.* vol. i. p. 146), seems to be the recurved-billed Humming-birds. Last of all comes the genus *PHÆTHORNIS* (example, SUPERCILIOUS HUMMING-BIRD—*Naturalist's Libr.* vol. ii. p. 119). Hitherto the form of the tail has been square, forked, or rounded; but in this group the tail is considerably and regularly graduated, the side feathers being very short, and the middle pair far exceeding all the others; the bill is not merely bent, but so much curved in the typical species, as nearly to assume the form of a sickle. The gay and beautiful colouring which ornaments the plumage of all the groups, here gives place to a brown colour, and even the throats of the male birds are destitute of ornament. The genus *Phæthornis*, in fact (according to Mr. Swainson's peculiar system), obviously represents the rasorial type (consisting of quails, partridges, fowls, &c.), and is a miniature likeness of the Hoopoes, or that family with which we began our survey of the *Tenuirostres*." With the fanciful system of Mr. Swainson, as far as *representation* is concerned, we have here no concern; but, as far as regards the natural affinities of the Humming-birds, he agrees in the main with Mr. Vigors.

Turning to Mr. G. R. Gray's "List of the Genera of Birds" (1841), we find the *Trochi-*

lidæ placed between the *Nectarinidæ* (American Honey-suckers) and the *Meliphagidæ* (Honey-eaters, peculiar to Australia and the adjacent islands of the Pacific Ocean). Now, we confess that we do not consider the views of the zoologists referred to, respecting the affinities, and, consequently, the systemic position of the Humming-birds to be correct. They are not related either to the Sun-birds of Africa and India, nor to the Honey-suckers of America, nor to the Honey-eaters of Australia. They constitute a group *per se*, not, however, without some alliance to the Swifts (*Cypselidæ*), which form a family entirely distinct from that of the Swallows (*Hirundinidæ*). In many points of structure this affinity is manifested, as in the form of the wing and the bones which support it—the abbreviation of the tarsi—the expanse and peculiar formation of the sternum—and in the number of the eggs, which is restricted to two. The similarity of the sternum, with its enormous keel, to that of the Swift, did not, as we have seen, escape the notice of Cuvier. In fact, if we look at the *TROCHILUS GIGAS* of the forests of Chili (Naturalist's Library, vol. ii. p. 50), making allowance for the length of bill, we shall find it to be very Swift-like in general contour, while the colouring of its plumage is dull. In length this gigantic species measures nearly eight inches.

We are not alone in our views relating to a

certain degree of affinity between the Humming-birds and the Swifts—an affinity, we have reason to believe, admitted to a certain extent by Mr. Gould.

On referring to the “*Conspectus Systematis Ornithologiæ*” (1849), by Charles Lucien Bonaparte, Prince of Canino, we find, under his third order *Passeres*, tribe one, *Volucres*, first in arrangement the *Goat-suckers*, next the *Swifts*, next the *Humming-birds*; the true *Swallows* being placed before the *Shrikes*, in his second tribe of the same order, viz. *Oscines*.

The same acute zoologist, in his “*Conspectus Generum Avium*,” adopts, as far as the Swifts and the Humming-birds are concerned, the same arrangement; having, therefore, greatly modified his views since the publication of his “*Specchio Comparativo*” (1827), and of his “*Birds of Europe and North America*” (1838).

While, however, we thus venture a not unsupported opinion that the Humming-birds are to a certain degree related to the Swifts, we do not, therefore, mean to deny that their place is taken in Africa and India by the Sun-birds. In both groups, the great end of their existence is to check the overbalance of the minuter species of the insect tribes, which crowd the nectaries of flowers, and prove injurious to the development of the capsules.

There is a great law, universally prevalent throughout nature—a law of destruction, by the

operation of which a numerical balance of life or of living beings is maintained in nice equilibrium—and the vast number of insectivorous birds, amongst which the Trochilidæ are not the least active, proves that, in the economy of nature, an incessant warfare against the insect world is essential. We may not, perhaps, at first perceive the necessity of this; but a little reflection will convince us of it; and accordingly we find that where insect life teems in profusion, there will the insect-destroyers abound in due proportion. Such is the polity of nature.

All living things have their destroyers—even the parasitic worm has its parasites—and no doubt the Humming-birds have in their turn their enemies, though perhaps to a far less extent, than have granivorous or graminivorous races (we may apply the observation generally to quadrupeds as well as birds), whose ravages unchecked would uncloth the fields and overthrow the forests. But whatever natural enemies the Humming-bird may have, Madame Merian's great spider is not one, although Lesson gives his authority for the fact.

It is somewhat interesting to trace the origin of the belief so recently entertained relative to the bird-catching spiders, a belief not altogether abandoned, inasmuch as credulity is congenial to common minds. Oviedo, in 1547, and Père Labat in his account of "Les Isles de Bermudez" (1640), describe spiders which make webs

strong enough to entangle small birds ; but neither writers say that they do so, and the latter expressly asserts that they are not hurtful ; although, after noticing the beauty of their markings, he adds that their webs are so strong as to impede small birds in their flight. These spiders, allied apparently to the elegant geometric spiders of Europe (*Epëira*), probably belong to the genus *Nephila* of Dr. Leach, of which one, the *Nephila clavipes*, makes the strongest web, in the West Indies.

Rochefort, in his " Histoire naturelle et morale des Antilles," 1658, admirably describes that large brown spider of South America, now called *Mygale*, and he ends his description with the following words—" They feed upon flies and similar creatures, and it is observed, that in some places, they spin nets which are so strong that small birds which become entangled therein, have considerable difficulty in extricating themselves. The same is said of the spiders which are commonly found in the Bermudas, held by the English, and it is very probable that those are of the same species." They are not, however, of the same species, for the *mygale* is a genus of ground spiders, and altogether different from that of the beautiful geometric spider, called *nephila*. It is here plain that Rochefort confounded the burrowing with the net-weaving spiders. Still we have no statement authorising us to believe that Humming-birds are the prey

of huge spiders. And now we come to Madame Merian. Here we shall follow that admirable zoologist, W. S. Macleay, who, in his Natural History of *Mygale* (Trans. Zool. Soc. I.) has demolished the whole fable.

After an interval of about forty years, Madame Maria Sibylla Merian, having read that Rochefort's large brown spider catches small birds in its web, or rather, supposing that it caught them, came at once to the conclusion that this entanglement was not without an ulterior object. Accordingly, in her work "*De Generatione et Metamorphosis Insectorum Surinamensium*," she has most obligingly figured from her imagination an enormous *mygale* in the very act of ungraciously devouring a Hummingbird. Hence, Linnæus, trusting to what he deemed good authority, termed this spider (of the generic habits of which he was ignorant)—*Aranea avicularia*—the Bird-catching spider. Hence, too, our ignorant book-makers sometimes devote a popularly pathetic paragraph and explanatory wood-cut to illustrate the ferocity of this spider-demon!

Cuvier, in his brief notice of the Hummingbirds (*Règne Animal*), does not once allude to this subject, but in the fourth volume of the same work, written for him by his Collaborateur, M. Latreille (Ed. 1829), we find at page 247, the following notice, relative to certain species of *Epëira*. "La toile de quelques espèces exotiques

est composée de fils si forts, qu'elle arrête de petits oiseaux, et embarrasse même l'homme qui s'y trouve engagé." It is singular with what tenacity, even the best naturalists will adhere to any story that has a touch of the marvellous, The fact is, that the strongest geometric web! which any spider in South America, Mexico, or the West Indies, is capable of weaving, would be cut through as by a spear, when dashed against by the smallest humming bird.

As, however, it is to the large brown spider of Rochefort, one of the genus *Mygale*, the *Aranea avicularia* of Linnæus, that Madame Merian and book-makers following in her train, have attributed the atrocious deed of slaughtering Humming-birds, we shall here revert to Mr. Macleay's paper.

The genus *Mygale*, "of which several and enormous species exist in Cuba, cannot possibly catch birds, because it spins no net, because it lives during the day in holes, under stones, or in tubes, sometimes three feet deep in the earth, and where certainly no Humming-bird can get at it, and finally, because *Mygale* is in itself too inactive in its motions, and humbly keeps too close to its mother earth to be able to get near a Humming-bird, which, as far as I have seen, never perches, except on branches. The true food of this spider I have found, from the debris in its tubes, to be *Juli*, *Porcellones* (woodlice), subterranean *Achetæ*, and those large

sluggish cockroaches, which swarm under almost every stone. So far from making a geometrical web, like the crafty *Epëiridæ*, *Mygale* only spins at times a fine white silken tapestry to line its tube withal, and to keep itself dry. In rainy weather, indeed, I have noticed the orifice of this tube, if not opening under a stone, to be sometimes closed by an irregular cobweb." In a note the writer says, "The holes of the *Mygale avicularia* are very common in my garden, and in external appearance are exactly what, in the gardens of England, are called toad-holes. The *Mygale* is of the greatest use to me, as it feeds on the *Achetæ*, *Gryllotalpæ*, *Blattæ*, and other subterranean *Orthoptera* (all burrowing insects) that are the greatest plagues of the horticulturalist in warm countries." The *Mygale* is nocturnal in its habits, wandering by night to great distances, and often crawling into houses, an unwelcome guest, although, from its inactivity, it may be easily, and without danger, crushed. Its bite, however, is said to be worse than the sting of the scorpion. "Nevertheless, as to these immense spiders (the expansion of whose feet has been sometimes found to extend nearly a foot wide) killing Humming-birds, it is not merely that they possess no net or other means for catching them, but they will not even devour them when caught; for I once placed a live Humming-bird and a small lizard (*Anolis*) in the tube of a *Mygale*, and it deserted it,

leaving my vertebrated animals untouched. When M. Langsdorff asked the people of Brazil if the *Caranguexeira*—for such is the terrific name of this spider in that country—fed on Humming-birds, they answered him with bursts of laughter that it only gratified its maw with large flies, ants, bees, wasps, beetles, &c.—an answer, the truth of which he afterwards found by personal experience.

“ The largest spiders that make a geometrical net belong to the genus *Nephila*; and the largest *Nephila* that I have seen in the West Indies, is the elegant *Nephila clavipes*, or *Epëira clavipes* of Latreille. This species is common in gardens suspended to trees in the centre of its web, the mathematical regularity of which may compete with that of the ancient spiders described by Ælian. Now it is certainly possible that the net of the *Nephila* may, in accordance with Labat’s account, accidentally arrest such small birds as are several species of *Trochilidæ*, but I do not believe that the spider would touch them. My garden is full of these *Nephilæ* in autumn, and I have tried to regale one of them with a small species of lizard (little more than an inch in length), by putting it into her net. The spider, on feeling the threads vibrate with the struggles of the lizard, instantly approached and enveloped it in her web. As soon, however, as it was thus disabled, the *Nephila* seemed to become aware of her mistake, and,

losing no time in cutting the lines, allowed her prisoner to fall to the ground."

In a note the writer adds, "The only two species of Humming-bird I have seen in the vicinity of the Havana, are the *TROCHILUS PECTORALIS* and *TROCHILUS COLUBRIS* of Dr. Latham, now assigned to distinct genera—the former remaining all the year round, while the latter appears only in winter. Both are strong enough to burst three such nets as those of *Nephila clavipes*; and in fact *Trochilus pectoralis* may be seen at times to pick small flies out of them." "Thus, then, I have proved," concludes Mr. Macleay, "that the *Mygale avicularia* does not catch birds any more than another *spider*, celebrated in one of our philosophical journals a few years back, could ever have lived on arsenic or corrosive sublimate; and, although undoubtedly there be more things on earth than are dreamt of by our philosophy, I will even go so far as to add my utter disbelief in the existence of any bird-catching spider. I am fully sensible that such a vermin, so interestingly disgusting, forms a treasure too valuable in the eyes of mere adepts in the free use of scissors and paste, for me to be able to dislodge it from their affections, when Langsdorff had already failed to break the charm; but however popularly pretty it may be thus occasionally to wander into fancy's maze, the dull, dry, unromantic naturalist must positively stick to the stubborn truth."

ORIGIN OF NAME.

But, although spiders do not catch Humming-birds, the latter, as we have seen, often rob the spiders' webs of the flies entangled therein; and Mr. Bullock admirably describes the actions of one species, the Mexican Star, which he frequently watched in the act of robbing spiders' nests, not, however, always without resistance on the part of the rightful owner, a circumstance which may probably have contributed to confirm the belief, that spiders spread their nets for the purpose of catching the birds, which, indeed, may sometimes have their wings entangled so as scarcely to be able to extricate them.

With respect to the term "Humming-bird," we need scarcely observe, that it is given to these beautiful little creatures in consequence of the buzzing noise produced in so many species by the rapid vibratory movement of the wings while suspended, as it were, in the air, they examine or probe the flowers in quest of food. Buffon well observes, that the vibration of the wings is so rapid, that the bird poised in the air, not only appears immoveable, but entirely without action. It is seen to stop thus some instants before a flower, and dart off like a gleam to another; it visits them all, plunging its little tongue into their bosom, caressing them with its wings, without ever settling, but at the same time never quitting them.

To the buzzing noise thus produced, they owe also the epithets of "*Murmures*," "*Bourbons*,"

and "*Frou-frous*," given to them by the Creoles of the Antilles and Cayenne.

To this bee-like, or insect-like mode of flight, to this hovering, and sudden darting away, the French term *Oiseaux-mouches* (Fly-birds), evidently alludes; but the meaning of the term *Colibri* is not very certain. Its derivation is not given in the *Dictionnaire Universel*. Buffon supposes it to be a Caraib word, while Lesson considers it to be a corruption of *Col brillant*, an epithet expressive of the everchanging metallic tints of the gorget or throat-feathers; but according to Sonnini, *Courberi* is the name given to these birds by the Garipous of Guiana; and as this word differs but little from *Colibri* or *Colubri*, we incline to Buffon's opinion. We cannot suppose it a derivative from the Latin *Cöluber* (an appellative of uncertain etymology), although it is so close to this word in sound and letters.

According to Hernandez, the ancient Mexican name for these birds was *Hoitzitziltototl* (avis varia) or *Hoitzitzilin*, to which various specific prefixes were added. Ximenes writes the word *Huitzitzil*, while Gomara gives it as *Vicicilin*. John de Laet states, that the Peruvian name is *Quenti*, and that the Spanish appellation was *Tomineios*. "Ourissia is the name recorded by Nieremberg, and *Guianumbi*, according to Marcgrave and others, is the Brazilian designation. These and other native terms are said to

signify rays of the sun, tresses of the daystar, murmuring birds, and the like. The Spanish *Tominos*, or *Tomineios*, seems to refer to their diminutive size and small weight (*Tomin*, the third part of a drachm), and *Picaflores*, another term employed by the Spanish and Portuguese Creoles to express their mode of taking their food. The late Captain Lyon, R.N. in his *Journal of a Residence and Tour in the Republic of Mexico* (1828), states, that in the neighbourhood of Xalapa the Humming-bird is distinguished by the names of *Chupa-rosa* and *Chupa-myrt*, Rose-sucker and Myrtle-sucker."

To the ancient Mexicans, all brilliant creatures were objects of deep interest, and brilliant birds peculiarly so. The beauty and lustre of the boa constrictor, combined, with its vast dimensions and terrific powers, to render it an object of admiration, not unmingled with fear, and even superstitious worship. There was a royal menagerie, in the time of Montezuma, divided into two departments, one being appropriated to birds which did not live by prey; the other to birds of prey, quadrupeds, and reptiles. Three hundred men, according to the testimony of Cortez, took care of the birds, irrespective of skilful persons who watched their diseases and applied remedies. Of the three hundred attendants, some procured their food, — others distributed it, — others watched over the nests at the time of incubation, — whilst others, at certain seasons, plucked

their plumage; for the king not only delighted in the sight of so many species, but was very careful of their feathers, for the sake of the works in the fabrication of which they were used. Among the birds most prized by the Mexicans, was the *Trogon resplendens*, the long gorgeous tail-covert plumes of which were used as ornaments to head-dresses, the smaller feathers being reserved for the embellishment of mantles, and the composition of pictures and mosaic images or tablets. The feathers of another Trogon (*T. curucui*), according to Hernandez, were also employed in the same works of art, with which the temples were decorated. Nor were the brilliant Humming-birds less attractive, their metallic plumage being in great request for the purposes already noticed. Even at the present time, the Indians of Patzquara are celebrated for their skill in composing figures of saints, &c. with the feathers of the Humming-bird; and, according to Mr. Ward, these works of art are remarkable for delicacy of execution, no less than for brilliancy of colour. We have ourselves had the pleasure of inspecting several groups and sprigs of artificial flowers, in the possession of Mr. Gould, made in some of the convents in Mexico, as we understood, all formed of the feathers, and principally the metallic scale-like throat feathers of various species of Humming-bird, the centre of the flower in many cases being one of those small diamond-beetles

that glitter like an intensely-coloured gem. The execution of these feather-flowers is admirable, and their effect may easily be imagined by those acquainted with this group of winged gems.

The audacity, the swiftness, the brilliancy of the Humming-birds, have made a great impression on the natives of Mexico, and given rise to a fable much more apt, much more interesting and poetical than any described by Ovid, and which would figure well in his *Metamorphoseōn*. We learn from Humboldt, that, according to the religious belief of the Mexicans, Torgamiqui, the spouse of the god of war, conducted the souls of those warriors who had died in the defence of the gods into the mansion of the sun, and there transformed them into Humming-birds; an idea exquisitely spiritual, but perhaps only to be appreciated by those who have seen these birds gleaming like meteors or shooting-stars in their native regions.

A cabinet of Humming-birds is an impressive spectacle, and fills the mind not only with delight, but with deeper emotions; for in silent, but eloquent language, like the galaxy of stars in the firmament, it proclaims the divine hand of the Creator. There are some who like to know a reason for every thing; and such persons may ask, for what definite purpose is all this splendour given? We can give no answer. Why is the nacre of the sea-ear (*Haliotis*) so richly iridescent?—Why are the long bristles

of the creeping sea-mouse (*Aphrodita aculeata*) adorned with metallic blue, green, and gold? Such questions are idle.

But, magnificent as a cabinet of Humming-birds undoubtedly is, we must not suppose that the tints and effulgence are as brilliant as they were during life. "Europeans," says Mr. Bullock, "who have seen only the stuffed remains of these feathered little gems in museums, have been charmed with their beautiful appearance; but those who have examined them while living, displaying their moving crests, throats, and tails, like the Peacock, in the sun, can never look with pleasure on their mutilated forms. I have carefully preserved about 200 specimens in the best possible manner, yet they are still but the shadow of what they were during life. The reason is obvious: for the sides of the laminae or fibres of each feather being of a different colour from the surface, will change when seen in a front or oblique direction, and as each lamina or fibre turns upon the axis of the quill, the least motion, when living, causes the feathers to change suddenly to the most opposite hues. Thus, the one from Nootka Sound changes its expanded throat from the most vivid fire-colour to light green. The Topaz-throated does the same; and the Mexican Star changes from bright crimson to blue."

We were, a few days since, examining a Humming-bird, the gorget of which was intense eme-

raïd-green, but, on changing the light, that is, altering its angle of incidence, the emerald was changed into velvet-black. Audebert considered this changeableness to be due to the organization of the feathers, and to the manner in which the luminous rays are reflected on falling upon them ; and of this we think there can be little doubt, for each feather, when minutely inspected, presents us with myriads of little facets, so disposed as to present so many angles to the incidence of light, which will be diversely reflected, according to the position of the feather, and in some positions not reflected in any sensible degree, and thus emerald may become a velvet-black.

Lesson supposes that the brilliant hues of the plumage of the Humming-birds is derived from some elements contained in the blood, and elaborated by the circulation,—a theory we do not quite understand, inasmuch as colour is the result of the reflection of some rays and the absorption of others, caused by the arrangement of the molecules of any given body. He adds, however, that the texture of the plumes plays the principal part, in consequence of the manner in which the rays of light traverse them, or are reflected by the innumerable facets which a prodigious quantity of barbules or fibres present. All the scaly feathers, he observes, which simulate velvet, the emerald, or the ruby, and which one sees on the head and the throat of the *Epi-machi* (as the grand *Promerops* of New Guinea),

the Paradise-birds, and the Humming-birds, resemble each other in the uniformity of their formation; all are composed of cylindrical barbules, bordered with other analogous regular barbules, which in their turn support other small ones, and all of them are hollowed in the centre with a deep furrow, so that, when the light, as Audebert first remarked, glides in a vertical direction over the scaly feathers, the result is, that all the luminous rays are absorbed in traversing them, and the perception of black is produced. But it is no longer the same when the light is reflected from these feathers, each of which performs the office of a reflector; then it is that the aspect of the emerald, the ruby, &c. varying with the utmost diversity under the incidences of the rays which strike them, is given out by the molecular arrangement of the barbules. It is thus that the gorget of many species takes all the hues of green, and then the brightest and most uniformly golden tints down to intense velvet black; or, on the contrary, that of ruby, which darts forth pencils of light, or passes from reddish orange to a crimsoned red black.

It is thus, we think, that the everchanging hues of the gorgets of the Humming-birds from black to emerald, or ruby, or crimson, or flame-colour, are to be explained.

With respect to the senses of the Humming-birds, that of *sight* must be peculiarly strong;

not only do their actions on the wing demonstrate this, but the fact also, that the insect-food of many species is microscopic, and this they seize while darting to and fro upon the wing. The habits of migration peculiar to many species, shew, as far as these species are concerned, that the extent of vision is very great, while the power of discriminating and capturing microscopic insects, during flight, is a sufficient proof of extraordinary clearness and strength of perception.

The sense of *taste*, or of *discrimination* by the tongue, must be enjoyed also in a high degree of perfection. Birds that rifle the flowers of their sweets, and pick from the nectary the minute insects which there seek food and shelter, the tongue being the instrument used for this purpose, must have this organ in a most sensitive condition, otherwise, whatever its mobility or capability of extension, its utility would become circumscribed; and this the more so, as while probing deep tubular flowers, the eyes can be of little assistance in promoting the main object—namely, the acquisition of food.

There is, perhaps, no organ, among birds, which varies in its sensibility more than the tongue; in granivorous birds, as finches, or fowls, its sense of discrimination is very limited: but in the duck, the flamingo, the parrot, in the honey-eaters of Australia, and the honey-suckers of South America, the tongue enjoys the sense

of taste and discrimination acutely—it is both a *feeler* and a *taster*, and so in the Humming-bird, we may suppose that this organ, so complex, so extensible, so mainly essential in the acquisition of food, is not destitute of those properties which are necessary to render it an efficient instrument.

In all birds the sense of *hearing* is very acute, as on this faculty their safety greatly depends; nor in this respect do the Humming-birds manifest any inferiority; on the contrary, we have reason to believe that it is extremely acute, and that they hear each other's shrill calls from considerable distances.

The sense of *smell* is at a low ratio in most, perhaps all, birds; for, although the ancients, and many moderns, have regarded the vulture as being highly endowed in this respect, there is some reason to doubt whether this is really the fact. But, be this as it may, there is nothing in the olfactory organs of the Humming-bird to lead us to infer that this sense is especially acute. It is not essential to them, according to their way of life, as an aid to the eye and the tongue. The perfume of the flowers may be delicious, but it is not therefore that the Humming-bird should luxuriate in it. The fact is, that the pleasure which man derives through the medium of this sense, is denied to all other animals. It is true that a dog enjoys the smell of meat, not for the sake of the odour, but because that odour ema-

nates from the food it desires, or expects to receive; but man delights in the odour of flowers, in the balm-laden breeze, not because they promise to administer to his physical wants, but because they appeal, like form, beauty, or colour, to his intellectual nature, and produce sensations of mental pleasure. It is neither, therefore, from the beauty or the scent of the flowers, that the bird derives gratification; but they promise it honey, which it naturally relishes, and insects of which it is in quest. And as certain flowers have their peculiar insect-tenants, so do different species of Humming-birds select different flowers as their favourites, and ever hover around them, according to the species of insect upon which they are destined to feed.

It is not to the most beautiful birds that the voice of melody is given. The mocking-bird, the nightingale, and the thrush, are but plainly attired; and it would appear that if Nature be lavish in one respect, she is parsimonious in another. On these birds she has bestowed the gift of beauty—she has created them winged gems—she has chased their plumage with burnished metals, or overspread it with laminæ of topaz and emerald—she has strained, so to speak, at every variety of effect—she has revelled in an infinitude of modifications, whether we look at the hues or the development of the feathering. We can scarcely then expect that to such external perfection, the gift of song will be also

added; and, indeed, when we reflect upon the structure of the tongue, of the os hyoides which supports its base, and of the mechanism by which it is rendered capable of protrusion, remembering that the os hyoides is connected with the larynx, we cannot in reason suppose that these birds can be eminent as songsters. Nevertheless it would appear that some species at least utter, while perched, a sort of querulous warble.

The ordinary cry of the Humming-birds is sharp and shrill, generally uttered on the wing, and frequently reiterated by the males during their combats with each other. It is principally, says Lesson, in passing from one place to another, that their cry, which he likens to the syllables *tère-tère*, articulated with more or less force, is excited. Most frequently, he says, they are completely dumb; and he adds, that he has passed whole hours in observing them in the forests of Brazil without having heard the slightest sound proceed from their throats.

Mr. Bullock, speaking of the *TROCHILUS MINIMUS* of Jamaica, notices its song as simple and querulous. "The first of these minute creatures, less in size than some of the bees, I ever saw alive was," he says, "near the house of a gentleman at Kingston. He had taken his station on the twig of a large tamarind tree, which was close to the house, and overspread part of the yard; there, perfectly indifferent to the

number of persons constantly passing within a few yards, he spent most of the day. There were few blossoms on the tree, and it was not the breeding season, yet he most pertinaciously kept absolute possession of his dominion; for the moment any other bird, though ten times as large as himself approached near his tree, he attacked it most furiously, and drove it off, always returning to the same twig he had before occupied, and which he had worn quite bare for three or four inches, by constantly perching on it. I often approached within a few feet with pleasure, observing his tiny operation of dressing and pluming, and listening to his weak, simple, and often-repeated note. I could easily have caught him, but was unwilling to destroy so interesting a little visitant who had afforded me so much pleasure. In my excursions round Kingston I procured many of the same species, as well as the long-tailed black and a few others, as well as the one I have mentioned as the smallest yet described, but which has the *finest voice* of any. I spent some agreeable hours in the place that had been the Botanical Garden of Jamaica, and on the various trees now growing to a luxurious size met with many curious birds, among which this specimen was perched on the bread-fruit or cabbage-tree. He poured forth his *slight querulous note* among a most curious assemblage of the indigenous and exotic plants

and trees of the island, on a spot once the pride of Jamaica, but now a deserted wilderness."

It has been stated, we know not on what authority, that the CORA HUMMING-BIRD (Naturalist's Library, vol. i. p. 129) utters a song; and Jonston observes that although none of the Spanish authors make mention of the song of Humming-birds, two French writers, Levius and Theretus, declare that they do sing, and, moreover that they are so assiduous in song that no one who had not seen and heard them would believe that so sweet a strain could proceed from bodies so diminutive.

Among species so numerous, and so varied in form, it is not improbable that some may utter a slight querulous warble; but this we suspect to be the extent of their musical accomplishments. The voice of most is confined to a monosyllabic cry repeated when on the wing or under excitement.

Mr. Gosse, in his "Birds of Jamaica," speaking of a species which he calls the VERVAIN HUMMING-BIRD, *Mellisuga humilis*, but which we cannot help thinking is the *Trochilus minimus* of Linnæus, Buffon, Edwards, Latham, and others, who have erred in its admeasurements, says, "The present is the only Humming-bird that I am acquainted with that has a real song. Soon after sunrise in the spring months it is fond of sitting on the topmost branch of some

mango or orange tree, where it warbles in a very weak but very sweet tone a continuous melody for ten minutes at a time ; it has little variety. The others have only a pertinacious chirping." It is evidently to this bird that Mr. Bullock refers in the extract above quoted.

We have already stated that the Humming-birds are restricted to America and certain adjacent islands, none being found in any portion of the old world, or in Australia. To this subject, therefore, we should not advert, were it not for the strenuous assertions which we ourselves have heard, not from the lips of untravelled or uneducated persons, but of persons possessing general information, that these birds are natives of India and Africa—as they themselves could testify—nor would anything which could be said convince them to the contrary. The fact is this, they had seen the Sun-birds in India, and regarded them as Humming-birds, although there is no immediate affinity between them ; both groups, it is true, are commissioned to a similar work, namely, the destruction of minute insects infesting the petals and nectary of flowers. So far they represent each other in their respective regions, but are not on that account related by affinity to each other. In both groups the colouring is splendid and metallic—the flight rapid—the powers of wing great. In both groups the species are of small size, and most abundant where a luxuriant vegetation offers

them its attractions. At the same time the two groups are utterly distinct, as is the territorial range respectively assigned to them. No Sun-bird is a native of America—no Humming-bird of India or Africa.

Looking at the *Trochilidæ* as a whole, we may regard them as birds of a warm or temperate climate, but there are exceptions to this rule, for some species of migratory habits pass to the south as far as Tierra del Fuego, where they have been seen feeding on the flowers of the Fuschia, even during storms of snow and sleet.

Passing to the north, Nootka Sound and the whole region of the Columbia River, on the Pacific side of America, is visited during summer by the gorgeous *TROCHILUS RUFUS* (Naturalist's Library, ii. p. 71), one of the most brilliant of the group; while in Canada, and the Atlantic portion of North America, as far as the 50th degree of latitude and perhaps farther, it is represented by the *Trochilus Colibris*, or RUBY-THROATED HUMMING-BIRD (Naturalist's Library, vol. i. p. 85), a species of surpassing beauty.

In the Pacific, the humid island of Chiloe presents us with the *TROCHILUS KINGII*, as well as other species; and the celebrated isle of Juan Fernandez has two species, *TROCHILUS STOKESII* (Naturalist's Library, vol. ii. p. 55), and *TROCHILUS FERNANDENSIS*, which are not found on the adjacent continent. It is very remark-

able that this small island should possess two species, and that none should have hitherto been discovered in the Galapagos.

We need not say, that Humming-birds exist throughout the whole of the West India Islands, but it is remarkable that in most cases, the species are peculiar to their respective islands ; thus, the *TROCHILUS MINIMUS* of Jamaica is not found in Cuba.

Looking at the northern division of the vast continent of America, as far as the *Trochilidæ* are concerned, it is towards the equator, and chiefly in Mexico, that we find the most numerous species collected together. Here the group presents itself in profusion—a profusion in accordance with that of the flowering plants from which their food is obtained: sixty species or more may be regarded as Mexican, and of these few pass to the south, traversing the Isthmus of Panama, by which the north and south divisions of this great expanse of land are connected.

Turning to South America, it may be observed, that naturalists, almost up to the present time, have considered Brazil, Guiana, and Venezuela as the stronghold of this group—but we must proceed to the west. By more recent discoveries we learn, that by far the most numerous species of the *Trochilidæ*, and the most beautiful, are denizens of the high Cordilleras. Among these radiant species, we find the most powerful also, for beauty and power are seldom disjoined

in the works of nature, although not always associated together, or perhaps often associated together in the same species. The regions, for example, which produce the most beautiful of quadrupeds, produce also the most gigantic ; the same observation applies to birds and to reptiles. In such regions, life is in abundance, whether we look at the animal or the vegetable kingdom, and we may add, in its fullest power and glory. But to different regions, distinct forms of life are, as a rule, assigned, and that in harmony with laws, a portion of which only we can understand. This fact, however, cannot fail to strike us, namely, that where vegetable life is in profusion, there will animal life, according to the character of the vegetation, be also in profusion.

The eastern slopes of the Andes teem with animal and vegetable organization, attractive in all that enchants the eye, and baffles the pencil. Here, up to the very borders of the snow line, flourish phænogamous plants of great beauty, at elevations of 13,700 and nearly 15,000 feet, Humboldt found several species of *Culcitium* and *Espeletia* (*C. nivale*, *C. rufescens*, and *C. reflexum*, *E. grandiflora*, and *E. argentea*), *Sida Pichinchensis*, *Ranunculus nubigenus*, *Ranunculus Gussmanni* with red or orange-coloured blossoms, the small moss-like umbelliferous plant, *Myrrhis Andicola* and *Fragosa arctioides*. On the declivity of Chimborazo, the *Saxifraga Boussingaulti* grows beyond the limit of perpetual snow, on loose

boulders of rock, at an elevation of 15,770 feet. At a lower elevation, the *Orchideæ* enliven the clefts of the wildest rocks, and the trunks of gigantic trees. "This form," says Humboldt, "to which the *Vanilla* belongs, is distinguished by its bright green succulent leaves, by its flowers of many colours, and strange and curious shape, sometimes resembling that of winged insects, and sometimes that of the birds, which are attracted by the perfume of the honey vessels. Such is their number and variety, that to mention only a limited district, the entire life of a painter would be too short for the delineation of all the *Orchideæ* which adorn the recesses of the deep valleys of the Andes of Peru."

In a note, the same illustrious philosopher adds, "While in the temperate and cold zones there are only terrestrial *Orchideæ*, that is, such as grow on and close to the ground, tropical countries possess *both forms*, namely, the *terrestrial* and the *parasitic*, which grow on the trunks of trees. To the first-named of these two divisions belong the tropical genera, *Neottia*, *Cranichis*, and most of the *Habernarias*. We have also found both forms growing as alpine plants, on the slopes of the chain of the Andes of New Granada and Quito. Of the parasitical *Orchideæ* (*Epidendreæ*), we have found *Masdevallia uniflora* at about 10,230 feet, English measure; *Cyrtochilum flexuosum* at about 10,100 feet; and *Dendrobium aggregatum* at about 9,480 feet. Of

the terrestrial Orchideæ, we have observed the *Altensteinia paleacea*, near Lloa Chiquito, at the foot of the volcano of Pichincha." To these plants we may add *Pitcairnias*, which, in the Andes, grow out of clefts in the rocks; the great *Pournetia pyramidata* (the Atschupalla of the elevated plains of New Granada), the *Agave*, *Bromelias*, and *Euphorbiaceæ*, with hundreds besides, which we have no occasion here to enumerate.

It is on the slopes of the Andes and their great land-spurs, so luxuriant in vegetation, a vegetation moreover of a peculiar character, that the richest and finest Humming-birds are to be found; it is there, too, that the greatest diversity of form prevails. But it is not only on the slopes of the Andes that the *Trochilidæ* swarm; they abound equally in the low lands, each species having its own especial range of habitat.

Some species, for example, comparatively feeble in flight, less active in habits than others, and with small bills, tenant the open glades of the deep forest, where the flowers of various lianes or twining plants, as *Paullinias*, *Banisterias*, *Bignonias*, and *Passifloras* offer them their due supply. Other species are peculiar to deep sheltered gorges or valleys, where the foliage is ruffled by no breath of wind, where the leaves seem to sleep in a still and sultry atmosphere. Others of more powerful flight, bold and active, brave the snow-clad mountains of Chimborazo, Pi-

chinchá, and Cotopaxi; and, generally, every mountain range possesses its own peculiar species. To these high mountain Humming-birds, truly *Nivicolæ*, Mr. Gould has assigned the generic title of *Oreotrochilus*. These species, as *TROCHILUS ESTELLA*, *TR. LEUCOPTERUS*, *TR. CHIMBORAZO*, *TR. PICHINCHA*, *TR. ADELA*, and *TR. MELANOGASTER*, breed in these snow-clad regions, at an elevation of from twelve or fourteen to fifteen or sixteen thousand feet. In fact, Bourcier found certain species of this genus breeding on the rocks of Chimborazo, while sheltering himself from a violent snow-storm on the borders of the snow-line.

Other genera, however, contain mountain species, as *Oxyphogon*; of which one (*TROCHILUS LINDENII*) has been discovered on the Sierra Nevada de Merida at an elevation of 13,000 feet. Thus, then, it is a mistake to suppose that a hot climate is necessary for every species. Speaking of the vegetation of the elevated plateaus of the Andes, Baron Humboldt says, —“ Everywhere around, the confines of the forest are encircled by broad bands of social plants, as the delicate *Aralia*, the *Thibaudia*, and the myrtle-leaved *Andromeda*; whilst the Alpine Rose, the magnificent *Befaria*, weaves a purple girdle round the spiry peaks. In the cold regions of the Paramos, which is continually exposed to the fury of storms and winds, we find that flowering shrubs, and herbaceous

plants bearing large and variegated blossoms, have given place to monocotyledons, whose slender spikes constitute the sole covering of the soil. This is the zone of the grasses, one vast savannah extending over the immense mountain plateaux, and reflecting a yellow, almost golden tinge, to the slopes of the Cordilleras, on which graze the Lama and the cattle domesticated by the European colonist. Where the naked trachyte rock pierces the grassy turf, and penetrates into those higher strata of air, which are supposed to be less charged with carbonic acid, we meet only with plants of an inferior organization, as lichens, lecideas, and the brightly-coloured dust-like lepraria, scattered around in circular patches. Islets of fresh-fallen snow, varying in form and extent, arrest the last feeble traces of vegetable development, and to these succeeds the region of perpetual snow." Who could suspect that, up to the borders of this region, the range of the *Trochilidæ* extended!

Mr. Darwin (*Journal of Researches*) observed Humming-birds in the sequestered shades of the Gavia or topsail mountain near Rio de Janeiro. "The air," he says, "was delightfully cool and fragrant; and the drops of dew still glittered on the leaves of the large liliaceous plants which had shaded the streamlets of clear water. Sitting down on a rock of granite, it was delightful to watch the various insects and birds as they flew past. The Humming-birds

seem particularly fond of such shady retired spots. Whenever I saw these little creatures buzzing round a flower, with their wings vibrating so rapidly as to be scarcely visible, I was reminded of the Sphinx-moths; their movements and habits are, indeed, in many respects very similar." The Sphinx-moths are crepuscular in their habits, and so are many of the *Trochilidæ*, inasmuch as numerous flowers open their blossoms and exhale their odours only on the approach of evening; we may instance the beautiful large white Brugmanzia, the blossoms of which, on a summer's evening (we speak of plants kept in greenhouses in our island), are then redolent of perfume. To various species of Hummingbird the Brugmanzia is very attractive; and the DOCIMASTER ENSIFERUS has its bill enormously lengthened, in order to fit it as a probe for these large deep tubular flowers. In fact, the dense shades of the mountain forests, where so many of these birds revel, create a continual twilight, and preserve a humidity which gives the utmost luxuriance to vegetation. Here the variegated blossoms of the *Orchideæ*, climbing *Bauhinia*, *Passifloræ*, and the yellow-blossomed *Banisteria*, entwining the stems of forest trees, spread far and high in air; "and delicate flowers are unfolded from the roots of the *Theobromæ*, and from the thick and rough bark of the *Crescentia* and the *Gustavia*. In the midst of this abundance of flowers and leaves, and this luxuriantly wild en-

tanglement of climbing plants, it is often difficult for the naturalist to discover to which stem different flowers belong; nay, one single tree adorned with *Paulliniæ*, *Bignoniæ*, and *Dendrobia* presents a mass of vegetable forms which, if disentangled, would cover a considerable space of ground."—*Humboldt's Cosmos*.

Such is the crepuscular region of flowers, a region of vegetable glory, in which the Humming-birds flit on fairy wings, "from morn till dewy eve," and when eve is blending into the darkness of night.

When we say that many species of Humming-birds frequent gloomy openings in the forest, and deep glades, and exhibit crepuscular habits, it must not be supposed that we intend to assert that any are positively nocturnal, for on this point we have no information. If, however, species partially nocturnal should be discovered, we should feel but little surprise—so varied are these birds in local habitat, form, and general economy.

Many species affect water, skimming the surface, petrel-like, on wings formed very like those of the petrel, while the legs are remarkably minute. We do not suppose, however, that they ever rest upon the water; but they dart about close to it, seizing minute insects which hover low, and they examine the nectary of aquatic flowers, either floating on the pool, or forming a gay belt along its margin.

Thus the hot plain, the humid island, the dense forest, the marsh, and the bleak mountain—the deep gorge, the lonely glen—the extinct crater, and the cultivated garden, present us with their respective denizens. We might almost add, that peculiar forms of plants have their attendant species; and hence it happens that certain of these birds abound in isolated spots, which in a few days are utterly abandoned, the blossoms which attracted them having begun to fade. These visits are not as some have thought capricious, but quite the contrary: for though other flowers may be in perfection, they are not what the birds delight in, although to a different species they may be welcome. In fact, we have only to examine the bills, some straight and long—others comparatively short—some upturned with more or less curvature—some curved slightly downwards—others bent in the form of a sickle, to be assured that they are modified for probing flowers of very opposite forms and character; and the inference is clear that plants attractive to one group or genus will afford no inducement to the visits of another. And again, even where the bills are nearly similar and capable of probing the same flowers; yet as the blossom of every distinct plant entertains its own peculiar insect parasites, so, as one species of insect or another is most relished, by any given Humming-bird, will the plants furnishing it be therefore visited. The Humming-bird

with a beak longer than its own body, and that with a beak curved like a sickle, cannot obtain their food from the same flowers, and most probably do not capture the same insects.

Some species of the *Trochilidæ* are excessively local, insomuch that a bounded and limited valley—a woodland glade or forest margin—nay, even the depression or crater of an extinct volcano, will possess its permanent residents. On the contrary, other species are decidedly migratory, and pass over a vast extent of country according to the season. We may mention as examples the *TROCHILUS MANGO*, the *TROCHILUS COLIBRIS*, the *TROCHILUS RUFUS*, &c.

We believe, moreover, that those which tenant the high mountain ranges, are only partially migratory, ascending and descending, as the temperature may render it necessary, or as the plants may offer food. Mr. Darwin well describes the habits of two migratory species, both natives of Chile, with an allusion to a third species which he observed on the Cordilleras.

Speaking of Chile, a landstrip between the Andes and the Pacific Ocean, he writes: "Two species of Humming-birds are common, and I have seen a third kind within the Cordillera at an elevation of about 10,000 feet. King's Humming-bird, *MELLISUGA* (*TROCHILUS*) *KINGII*, is found over a space of 2500 miles on the west coast, from the hot dry country of Lima to the forests of 'Tierra del Fuego, where it has been

described as flitting about in a snow-storm. In the wooded island of Chiloe, which has an extremely humid climate, this little bird, skipping from side to side amidst the dripping foliage is perhaps more abundant than almost any other kind. It there very commonly frequents open marshy ground, where a kind of *Bromelia* grows; hovering near the edge of the thick beds, it every now and then dashed close to the ground; but I could not see whether it ever actually alighted. At the time of the year I refer to there were few flowers, and none whatever near the beds of *Bromelia*. Hence I was quite sure they did not live on honey; and on opening the stomach and upper intestine, by the aid of a lens, I could plainly distinguish in a yellow fluid morsels of the wings of diptera, probably tipulidæ. It is evident that these birds search for minute insects in their winter quarters under the thick foliage. I opened the stomachs of several specimens which were shot in different parts of the continent, and in all, remains of insects were so numerous as often to present a black comminuted mass as in the stomach of a creeper," (*Certhia*.)

In Central Chile these birds are migratory, they make their appearance there in autumn, and in the latter end of the month corresponding to our October, they were very common. In the spring, they began to disappear, and on the 12th of what would correspond to our March,

I saw only one individual. As this species migrates to the southward, it is replaced by a larger species, which will be presently described. I do not believe the small kind breeds in Chile, for, during the summer their nests were common to the south of that country. The migration of the Humming-birds on both the east and west coast of North America, exactly corresponds to what takes place in this southern continent. In both cases, they move towards the tropic during the colder parts of the year, and retreat northward (and southward) before the returning heat. Some, however, remain during the whole year in Tierra del Fuego; and in Northern California (which, in the northern hemisphere, has the same relative position which Tierra del Fuego has in the southern,) some, according to Beechey, likewise remain.

“ The second species, *TROCHILUS GIGAS*, is a very large bird for the delicate family to which it belongs. In the neighbourhood of Valparaiso, during this year (1834), it had arrived in numbers a little before the vernal equinox. It comes from the parched deserts of the north, probably for the purpose of breeding in Chile. When on the wing, the appearance of this bird is singular. Like others of the genus, it moves from place to place with a rapidity which may be compared to that of a *Syrphus* amongst dipterous insects, and a *Sphinx* among moths; but, whilst hovering over a flower, it flaps its wings with a very slow

and powerful movement, totally different from that vibratory one common to most of the species, which produces the humming noise. I never saw any other bird in which the force of the wings appeared (as in a butterfly), so powerful in proportion to the weight of the body. When hovering by a flower, its tail is constantly expanded and shut like a fan, the body being kept in a nearly vertical position. This action (of the tail) appears to steady and support the bird, between the slow movements of its wings. Although flying from flower to flower in search of food, its stomach generally contained abundant remains of insects, which I suspect are much more the object of its search than honey is. The note of this species, like that of nearly the whole family, is extremely shrill."

As we have already said, the *TROCHILUS GIGAS* is very swift-like in its general contour.

Audubon supposes, from his own observations, that the migratory movements of the Humming-birds are performed during the night. Speaking of the ruby-throated species, he says, "I have seen these birds in Louisiana as early as the 10th of March. Their appearance in that State varies, however, as much as in any other, it being sometimes a fortnight later, or, although rarely, a few days earlier. In the middle districts, they seldom arrive before the 15th of April, more usually the beginning of May. I have not been able to

assure myself whether they migrate during the day or by night, but am inclined to think the latter the case, as they seem to be busily feeding at all times of the day, which would not be the case had they long flights to perform at that period. They pass through the air in long undulations, raising themselves for some distance at an angle of about 40 degrees, then falling in a curve ; but the smallness of their size precludes the possibility of following them with the eye farther than fifty or sixty yards without great difficulty, even with a good glass. A person standing in a garden by the side of a common *Althæa* in bloom, will be as surprised to hear the humming of their wings and then see the birds themselves within a few feet of him, as he will be astonished at the rapidity with which the little creatures rise into the air, and are out of sight and hearing the next moment." He observes, that they settle only on twigs or branches, where they may be seen engaged in dressing their plumage, but they can quit their perch without the least difficulty in an instant. They "appear to be possessed of superior powers of vision, making directly towards a martin or blue-bird, when fifty or sixty yards from them, reaching it before it is aware of their approach. No bird seems to resist their attacks, but they are sometimes chased by the larger kinds of humble bees, of which they seldom take the least notice, as

their superiority of flight is sufficient to enable them to leave these slow moving insects far behind, in the short space of a minute."

The RUBY-THROATED HUMMING-BIRD has a particular liking for such flowers as are greatly tubular in their form. The common Simpson-weed or Thorn-apple (*Datura Stramonium*), and the Trumpet-flower (*Bignonia radicans*), are among the most favoured by their visits, and after these the Honeysuckle, the Balsam of the Gardens, and the wild species which grows on the borders of ponds, rivulets, and deep ravines; but every flower, down to the wild violet, affords them a certain portion of their sustenance. Their food consists principally of insects, generally of the coleopterous order; these, together with some equally diminutive flies, being commonly found in their stomach. The first are procured within the flowers, but many of the latter on wing. The Humming-bird might, therefore, be looked upon as an expert fly-catcher. The nectar or honey which they sip from the different flowers being of itself insufficient to support them, is used more as if to allay their thirst." Mr. Gosse, in his *Birds of Jamaica*, a work of which we cannot speak too highly, gives us, from personal observation, an admirable account of the habits and manners of the species indigenous in that island, from which we shall select a few illustrative passages.

Speaking of the MANGO HUMMING-BIRD, he

says, — “ It affects the lowlands in preference to the mountains, and open places rather than the deep woods ; yet is rarely seen to suck the blossoms of herbs or shrubs, as *TROCHILUS HUMILIS* does, but, like *POLYTMUS* (the long-tailed Humming-bird), hovers around blossoming trees. The bunch of blossom at the summit of the pole-like Papaw-tree (*Carica Papaya*) is a favourite resort of this species, particularly at sunset. This habit I observed, and took advantage of very soon after my arrival ; for there was a fine male Papaw-tree in profuse bloom close to the door at Bluefields, which the Mango frequented.”

. “ The pugnacity of the Humming-birds has been often spoken of ; two of the same species can rarely suck flowers from the same bush, without a rencontre. Mango, however, will even drive away another species, which I have never observed the others to do. I once witnessed a combat between two of the present species, which was prosecuted with much pertinacity, and protracted to an unusual length. It was in the month of April, when I was spending a few days at Phoenix Park, near Savanna le Mer. In the garden were two trees of the kind called the Malay Apple (*Eugenia Malaccensis*), one of which was but a yard or two from my window. The genial influence of the spring rains had covered them with a profusion of beautiful blossoms, each consisting of a multitude of crimson stamens with very minute petals, like bunches

of crimson tassels; but the leaf-buds were only just beginning to open. A Mango Humming-bird had every day, and all day long, been paying his devoirs to these charming blossoms. On the morning to which I allude another came, and the manœuvres of these two tiny creatures became highly interesting. They chased each other through the labyrinth of twigs and flowers, till an opportunity occurring, the one would dart with fury upon the other, and then, with a loud rustling of their wings, they would twirl together round and round until they nearly came to the earth. It was some time before I could see with any distinctness what took place in these tussles; their twirlings were so rapid as to baffle all attempts at discrimination. At length an encounter took place pretty close to me, and I perceived that the beak of the one grasped the beak of the other, and thus fastened both whirled round and round in their perpendicular descent, the point of contact being the centre of the gyrations, till, when another second would have brought them both on the ground, they separated, and the one chased the other for about a hundred yards, and then returned in triumph to the tree, where, perched on a lofty twig, he chirped monotonously and pertinaciously for some time; I could not help thinking in defiance. In a few minutes, however, the banished one returned, and began chirping no less provokingly, which soon brought

on another chase and another tussle. I am persuaded that these were hostile encounters (both were adult males), for one seemed evidently afraid of the other, though his indomitable spirit would prompt the chirp of defiance; and, when resting after a battle, I noticed that this one held his beak open, as if panting. Sometimes they would suspend hostilities to suck a few blossoms, but mutual proximity was sure to bring them on again with the same result. In their tortuous and rapid evolutions, the light from their ruby necks would now and then flash in the sun with gemlike radiance; and as they now and then hovered motionless the broadly-expanded tail, whose outer feathers are crimson-purple, but when intercepting the sun's rays transmit orange-coloured light, added much to their beauty. A little Banana Quit (a species of creeper or *certhia*, which hops among the flowers and probes them, clinging in all positions) that was peeping among the blossoms in his own quiet way, seemed now and then to look with surprise on the combatants; but when one had driven his rival to a longer distance than usual, the victor set upon the unoffending Quit, who soon yielded the point, and retired humbly enough to a neighbouring tree. The war, for it was a thorough campaign, a succession of battles, lasted fully an hour, and then I was called away from the post of observation."

We may here observe that the MELLISUGA

HUMILIS (or *T. minimus*?) passes by the flowers of the Malay Apple, but eagerly sucks those of the Cashew-tree (*Anacardium*), while the Mango despises the latter, and is attracted by the former.

The same writer, commenting on the habits of the POLYTMUS or LONG-TAILED HUMMING-BIRD, observes, that this species, a permanent resident in Jamaica, is seen at all seasons, and in all situations. "It loves to frequent the margins of woods and roadsides, where it sucks the blossoms of the trees, occasionally descending to the low shrubs. There is one locality where it is abundant—the summit of that range of mountains just behind Bluefield, and known as the Bluefield's ridge. Behind the peaks, which are visible from the sea, at an elevation of about half a mile, there runs through the dense woods a narrow path, just passable for a horse, overrun with beautiful ferns of many graceful forms, and always damp and cool. No habitation occurs within several miles, and no cultivation, save the isolated provision grounds of the negroes, which are teeming with enormous Arums, and these are hidden from view far up in the thick woods." "The refreshing coolness of this road, its unbroken solitude, combined with the peculiarity and luxuriance of the vegetation, made it one of my favourite resorts. Not a tree from the thickness of one's wrist up to the giant magnitude of the hoary figs and

cotton-trees, but is clothed with fantastic parasites; begonias with waxen flowers, and ferns with hirsute stems climb up the trunks; enormous bromelias spring from the greater forks, and fringe the horizontal limbs; various Orchideæ with matted roots and grotesque blossoms droop from every bough, and long lianes like the cordage of a ship depend from the loftiest branches, or stretch from tree to tree. Elegant tree-ferns and towering palms are numerous; here and there the wild plantain or Heliconia waves its long flag-like leaves from amidst the humbler bushes, and in the most obscure corners, over some decaying log nods the noble spike of a magnificent limodorum. Nothing is flaunting or showy—all is solemn and subdued, but all is exquisitely beautiful. Now and then the ear is startled by the long-drawn measured notes of the Solitaire (the organist of Buffon, a slender-billed warbler), itself mysteriously unseen, like the hymn of praise of an angel. The smaller wood consists largely of the plant called glass-eye berry, a scrophularious shrub, the blossoms of which, though presenting little beauty in form or hue, are pre-eminently attractive to the long-tailed Humming-bird. These bushes are at no part of the year out of blossom, the scarlet berries appearing at all seasons on the same stalk as the flowers. And here at any time one may with tolerable certainty calculate on finding these very lovely birds. But it is in March, April,

and May that they abound. I suppose I have sometimes seen not fewer than a hundred come successively to rifle the blossoms within the space of half as many yards in the course of a forenoon. They are, however, in no respect gregarious; though three or four may at one moment be hovering round the blossoms of the same bush, there is no association; each is governed by his individual preference, and each attends to his own affairs. It is worthy of remark, that males compose by far the greater portion of the individuals observed at this elevation. I do not know why it should be so, but we see very few females there, whereas in the lowlands this sex outnumber the other. In March a large number are found to be clad in the livery of the adult male, but without long tail-feathers; others have the characteristic feathers lengthened, but in various degrees. These are, I have no doubt, males of the preceding season. It is also quite common to find one of the long feathers much shorter than the other, which I account for by concluding that the shorter is replacing one that had been accidentally lost. In their aerial encounters with each other, a tail-feather is sometimes displaced. One day several of these "young bloods" being together, a regular tumult ensued, somewhat similar to a *sparrow-fight*: such twittering, and fluttering, and dartings hither and thither! I could not exactly make out the matter, but suspected that it was

mainly an attack—surely an ungallant one—made by these upon two females of the same species that were sucking at the same bush. These were certainly in the skirmish, but the evolutions were too rapid to be certain how the battle went.

“The whirring made by the vibrating wings of the male *Polytmus* is a shriller sound than that produced by the female, and indicates its proximity before the eye has detected it. The male almost constantly utters a monotonous quick chirp, both while resting on a twig or while sucking from flower to flower. They do not invariably probe flowers on the wing; one may frequently observe them thus engaged when alighted and sitting with closed wings; and often they partially sustain themselves, by clinging by the feet to a leaf while sucking, the wings being expanded and vibrating.”

The clinging power of the feet of Humming-birds is very remarkable; and, indeed, according to Bullock, they frequently while sleeping suspend themselves by the feet with the head downwards, in the manner of some parrots, as, for example, the Love-birds (*Psittacula*) of Africa. In the Swift this clinging power of the foot is very great; but here the four toes are all directed forwards. Mr. Gosse says that the Humming-birds, as a general rule, sleep (he alludes to those of Jamaica) with the head not behind the wing, but slightly drawn back on the shoulders.

They clasp their perch very firmly, even to the wearing away of the bark on their accustomed resting twig.

Mr. Gosse thus describes the manners of his VERVAIN HUMMING-BIRD, *Mellisuga humilis* (*Trochilus minimus?*), the application of *vervain* being applied from its habit of buzzing over the low herbaceous plants of pastures, amongst which the vervain is most conspicuous. "The West Indian Vervain (*Stachytarpheta*) is one of the most common weeds in neglected pastures, shooting up everywhere its slender columns set around with blue flowers to the height of a foot. About these our little Humming-bird is abundant during the summer months, probing the azure blossoms a few inches from the ground. It visits the spikes in succession, flitting from one to another exactly in the manner of the honey-bee, and with the same business-like application and industry. In the winter the abundance of other flowers, and the paucity of vervain-blossoms induce its attentions to the hedgerows and woods.

"I have sometimes watched with much delight the evolutions of this little species at the moringa tree. When only one is present he pursues the round of the blossoms soberly enough. But if two are about the tree, one will fly off and suspend himself in the air a few yards distant, the other presently shoots off to him; and then, without touching each other, they

mount upward with strong rushing wings, perhaps for five hundred feet. They then separate, and each shoots diagonally towards the ground, like a ball from a rifle, and wheeling round comes up to the blossoms again, and sucks as if it had not moved away at all. Frequently one alone will mount in this manner, or dart on invisible wing diagonally upward, looking exactly like a humble-bee. Indeed, the figure of the smaller Humming-birds on the wing, their rapidity, their arrowy course, and their whole manner of flight, are entirely those of an insect, and one who has watched the flight of a large beetle or bee will have a very good idea of one of these tropic gems painted against the sky. I have examined all our three species at one time engaged in sucking the blossoms of the moringa, and have observed that whereas *POLYTMUS* and *MANGO* expand and depress the tail when hovering before flowers, *HUMILIS*, on the contrary, erects the tail, but not invariably.

“All the Humming-birds have more or less the habit of throwing the body and tail into odd contortions; this seems to be most the case with *Mango*, but is perhaps more observable in *Polytmus*, from the effect that such motions have on the long feathers of the tail. That the object of these quick turns is the capture of insects I am sure, having watched one thus engaged pretty close to me. I drew up and observed it carefully, and saw the minute flies in the air which

it pursued and caught, and heard repeatedly the snapping of the beak."

In addition to our previous observations, we may here state, that the heart in these birds is proportionately very large and muscular. This, indeed, might be expected, seeing that their muscular exertions are strenuous and almost continually in operation. The neck is in reality long, but it appears to be short, because the cervical column takes a sigmoid curve down to the breast, and its shape, therefore, is concealed by the plumes of the chest.

The tongue, as we have said, is bifid, consisting of two tubular filaments, laid side by side, united for half their length but separated for the remainder. Their substance, during the lifetime of the bird, is transparent in the same degree as a good quill, which they much resemble. "Each tube is formed by a lamina rolled up, yet not so as to bring the edges into actual contact, for there is a longitudinal fissure on the outer side, running up considerably higher than the junction of the tubes; into this fissure a pin may be inserted and moved up and down the length. Near the tip, the outer edge of each lamina ceases to be convoluted, but is spread out and split at the margin into irregular fimbriæ which point backward, somewhat like the vane of a feather; these are not barbs, however, but simply soft and flexible points such as might be produced by snipping diagonally the edge of a strip

of paper. I conjecture that the nectar of flowers is pumped up the tubes, and that minute insects are caught, when in the flowers, in these spoon-like tips, their minute limbs being, perhaps, entangled in the fimbriæ, when the tongue is retracted into the beak, and the insects are swallowed by the ordinary process, as doubtless are those captured with the beak in flight. I do not thoroughly understand the mode by which liquids are taken up by a Humming-bird's tongue, though I have carefully watched the process. If syrup be presented to one in a quill, the tongue is protruded for about half-an-inch, the beak resting in the pen as it is held horizontal: there is a slight, but rapid and constant projection and retraction of the tubes, and the liquor disappears very fast, perhaps by capillary attraction, perhaps by a sort of pumping, certainly not by licking."

It is by a pumping or sucking action, as we have every reason to believe, that nectar or fluids are absorbed by the tubular tongue of these birds, and it is most probable that the fimbriated tip is bedewed by a glutinous secretion—a secretion used in many instances as the means of compacting together the materials of which the external crust of the nest is composed. This secretion is most probably afforded by the salivary glands. The tongue of the woodpecker, which in the mechanism required for projection and retraction, closely resembles that of the

Humming-birds, has its fimbriated tip moistened with a glutinous saliva, and is thereby enabled to drag forth insects from their concealment, for they are not transfixcd by 'the point of the tongue as some have supposed. The toad, the frog, the chameleon, are among reptiles examples in which a projectile tongue is lubricated by a viscid secretion for the purpose of securing insects. But the double spatulate extremity of the tongue of the Humming-bird, fimbriated along the margin, lubricated, capable besides of seizing, and moreover, as we believe, endowed with exquisite sensibility, is a more perfect instrument than that of the woodpecker, or of the reptiles alluded to. In no other vertebrate animals, as far as we know, is the tongue constructed as a tubular sucking-pump; so far the Humming-birds stand alone, and this circumstance in itself, considering it with reference to organic structure, might be adduced as a reason for regarding these birds as a distinct order. We do not here forget the filamentous-tongued Parrakeets, *Trichoglossi*, which feed on the nectar of flowers. In these birds the tongue is brush-like, being fringed at the tip with (as it is said) tubular processes or filaments, and is capable of considerable protusion. We doubt the tubular structure of the filaments forming the brush, and certainly the tongue itself is not tubular. It appears to us, that the *Trichoglossi* dip their tongues into the nectaries of flowers, saturate the brush, and

swallow the juice compressed from it, when it is returned within the beak. The *Trichoglossi*, or Honey-eating Parrakeets, are found in New Guinea, and the Moluccas, but Australia is the great nursery for the birds of this form. Mr. Gould, in his "Introduction to the Birds of Australia," merely calls their tongue *pencilled*, and describes their swift and arrow-like flight, and their mode of dashing among the branches, the flowers of which yield them food. As far as our own observation goes, the tongue of these Honey-eating Parrakeets terminates in filaments, constituting a little brush or pencil, and is not in any respect similar to that of the Humming-birds; it is not a truly suctorial organ, but an organ for absorbing or licking up the semifluid nectar. These *Trichoglossi* invariably cling while feeding; and associated together in vast flocks, they make the woods re-echo with their deafening cries.

We may, then, confidently state that the tongue of the *Trochilidæ* is unique, and pre-eminently characteristic of habits and manners distinct from those of the rest of the feathered race.

From these observations we now turn to a contemplation of the *Trochilidæ*, as respects other points of their economy. And, first, we may advert to their nidification—a subject on which much may be said, not without leaving room for future details. The nidification of the Hum-

ming-birds is as varied as are the species themselves in form and local habit. In every instance, however, the nest is peculiar and beautiful, and constructed of the most delicate and filmy materials. Generally speaking, it is thickly lined with a sort of wadding or felt, consisting of a cottony substance, the down or pubescence of different flowers, plants, or trees, varying in colour from white and straw-yellow to deep chestnut-brown. Some nests, however, which we have examined, have only a slight lining, and are loose in general texture. Of these nests some are cup-shaped, others conical, others with singular appendages, acting evidently as balancers, in order to steady a pendent cradle. Externally the nest is coated with particles of lichen commingled with vegetable filaments, moss, the webs of spiders, or threads apparently derived from the cocoons of insect pupæ. In position these nests are as different as imagination can conceive; some are attached to the fork of a branch; others are bound to a waving twig enshrouded by foliage; others are pendent, attached to the extremity of the leaves of palms, flags, and other plants overhanging water; others, again, build on rocks, hanging their nests by filaments to the sides of bold precipices. Several species hang their nests to the extremity of slender pendent tendrils; and from some of these nests a projection bulges out, containing a stone, or two or more stones, acting as a coun-

terpoise to the weight of the parent and young, thus keeping it evenly balanced. How these stones are raised up is a mystery, but such is the fact. In these instances, the twig runs through the nest between the cup and the stone-laden projection. Hence, it is evident that a counterpoise, by way of keeping it steady, is at least desirable. Three nests are before us, which we will describe, as they differ from each other very decidedly. It is not clear to what species they respectively belong. The first is built amidst the slender coronal stems of a species of bamboo, which support it all round, and effectually prevent its dislodgment, however the bamboo may bend to the breeze, while the leaves form a canopy above. The nest is cup-shaped, constructed of interwoven filaments of moss, lined with down, and coated externally with grey lichen, held together by webs

The second, belonging to one of the genus *Phaethornis*, is attached by webs to the end of a long flag-leaf. It is conical in form, of a very loose or open texture, consisting of vegetable fibres, webs, bits of moss, &c., with a very slight lining. It was brought from Brazil, where the need of a dense warm nest is perhaps less necessary than in colder latitudes, or in elevated situations.

The third is a pendent nest also, attached to the slight waving stem of a frond of fern, over which other fronds hang in graceful luxuriance.

Externally it is made up with bits of decayed bark, minute chips and fragments of vegetables, fibres, and lichen, the inside lining being composed of soft down or vegetable wool.

A most beautiful nest of an unknown species we have lately examined; it was suspended at the end of a slender twig, with the footstalks of the leaves passing through its sides, and shrouded by leaves above. It consisted entirely of the finest silky down or cotton, of a most delicate straw-yellow, felted into a mass, forming a structure at once light, soft, and compact. This nest must have rocked to and fro with every breath of air.

In many cases the lining of the nests assumes an almost spongelike appearance, and the nest itself seems a mere accidental excrescence on a branch, the bark of the latter, and the outer coating of the former assimilating in colour and general characters.

Audubon, speaking of the *TROCHILUS COLUBRIS*, says,—“The nest of this Humming-bird is of the most delicate nature, the external parts being formed of a light-grey lichen, found on the branches of trees or on decayed fence-rails, and so neatly arranged round the whole nest, as well as to some distance from the spot where it is attached, as to seem part of the branch or stem itself. These little pieces of lichen are glued together with the saliva of the bird. The next coating consists of cottony substance, and the

innermost of silky fibres obtained from various plants, all extremely delicate and soft. On this comfortable bed, as in contradiction to the axiom that the smaller the species the greater the number of eggs, the female lays only two, which are pure white, and almost oval. Ten days are required for their hatching, and the birds raise two broods in a season. In one week the young are ready to fly, but are fed by the parents for nearly another week. They receive their food directly from the bill of their parents, which disgorge it in the manner of canaries or pigeons. It is my belief that no sooner are the young able to provide for themselves than they associate with other broods and perform their migration apart from the old birds, as I have observed twenty or thirty young Humming-birds resort to a group of trumpet-flowers, when not a single old male was to be seen. They do not receive the full brilliancy of their colours until the succeeding spring, although the throat of the male birds is strongly imbued with the ruby tints before they leave us in autumn." Generally speaking, the nest of the Ruby-throated Humming-bird is fixed on the upper surface of some mossy branch, at no great distance from the ground; but other and variable sites are occasionally selected.

Prince Maximilien de Neu-Wied, upon one occasion, when examining the flower of a palm-tree in Brazil, found affixed to it the nest of the

BLUE-HEADED HUMMING-BIRD (*Trochilus pileatus*), and observes, that it was as well covered externally with moss, as is the nest of the Gold finch and some other small European birds. All the nests of the Trochilidæ are, as we have seen, by no means so substantially composed, for some consist principally of thistle-down, cotton, and delicate fibres.

In some instances, whether from accidental causes or the contrary does not seem very clear, Humming-birds having made a shallow nest, elevate its sides according to the growth of the young, building up, as it were, a cradle for them. The late Captain Lyon, R.N., whose scientific acquirements and habits of close observation need no comment, thus writes to a friend in England, his letter being dated Gongo Soco, Brazil, March 17, 1829. "I am too closely confined here, and too constantly occupied to attend much to natural history, or to anything except the mines ; but it may interest you to have an account of some young Humming-birds, whose hatching and education I studiously attended, as the nest was made in a little orange bush by the side of a frequented walk in my garden. It was composed of the silky down of a plant, and covered with small flat pieces of yellow lichen. The first egg was laid January 26th, the second on the 28th, and two little creatures like bees made their appearance on the morning of February 14th. As the young increased in size, the

mother built her nest higher, so that from having at first the form of figure 1, it ultimately became like figure 2. The old bird sat very close during the continuance of the heavy rain for several days and nights. The young remained *blind* until February 28th, and flew on the morning of March 7th without previous practice, as strong and swiftly as the mother, taking their first start from the nest to a tree about twenty yards distant."—*Zool. Journal*, vol. v.

Mr. Gosse, in his interesting work on the Birds of Jamaica, thus describes the nest of the MANGO HUMMING-BIRD (Naturalist's Library, vol. ii. p. 100), which had been presented to him. "It has evidently been constructed to stand upon a horizontal twig which the bottom has embraced. It is cylindrical externally, the bottom being nearly flat. Its height is $1\frac{1}{2}$ inch; its external diameter a little more; its internal diameter, 1 inch; the hollow, which is a little overhung by the margin, is cup-shaped about $\frac{7}{8}$ ths of an inch deep. It is composed almost entirely of the down of the gigantic silk-cotton tree (*Eriodendron anfractuosum*), intermixed at the bottom with a little true cotton. The sides are tightly banded round with the threads of spiders' webs very neatly put on, and the whole exterior is studded with a minute whitish lichen so profusely as almost to conceal the down, without at all injuring the symmetry of the form. It is a most compact and beautiful little structure.

“ The down of the cotton-tree is the material ordinarily chosen by all our Humming-birds for the construction of their nests. The tree attains a giant size and diameter, and throws out to a vast distance its horizontal limbs, each equalling in its dimensions an ordinary forest-tree. It is one of the few in those tropical islands which are deciduous. The fierce blasts called *norths*, which prevail in January and February, pouring down from the mountains quickly lay it bare. I have seen an enormous tree in full foliage almost leafless in an hour, the leaves filling the air like flakes of snow in a driving storm. While it is yet denuded, the pods appear at the ends of the branches, resembling green walnuts; these ripen before the leaves bud, and opening give freedom to a mass of fine silky filamentous down, which is borne away upon the wind. These filaments are so fine that, at this season, April and May, they are imbibed with the air we breathe, being almost impalpable, and are considered to aggravate pulmonary affections. The tufts so scattered, the Humming-birds, and others of the feathered tribes diligently collect, and that not only on the ground. I have been amused to observe a Mango Humming-bird suspending himself in the air, over against a puff of down, which was slowly borne along upon a gentle breeze, pecking at it, and drawing filaments from it, doubtless with a view to nest building.”

The same observant naturalist, speaking of the

LONG-TAILED HUMMING-BIRD (*Trochilus Polytmus*, Naturalist's Library, vol. ii. p. 108), the gem of Jamaican ornithology, as exquisite in form as in brilliancy of plumage, makes the following observations :—“ The Humming-birds in Jamaica do not confine themselves to any particular season for nidification. In almost every month of the year I have either found, or had brought to me, the nests of *Polytmus* in occupation. Still, as far as my experience goes, they are most numerous in June; while Mr. Hill considers January as the most normal period. It is not improbable that two broods are reared in a season. In the latter part of February, a friend shewed me a nest of this species in a singular situation, but which I afterwards found to be quite in accordance with its usual habits. It was at Bognie, situated on the Bluefield Mountain. About a quarter of a mile within the woods, a blind path, choked up with bushes, descends suddenly beneath an overhanging rock of limestone, the face of which presents large projections and hanging points, encrusted with a rough tuberculous sort of stalactite. At one corner of the bottom there is a cavern, in which a tub is fixed to receive water of great purity, which perpetually drips from the roof, and which in the dry season is a most valuable resource. Beyond this, which is very obscure, the eye penetrates to a larger area, deeper still, which receives light from some other communication

with the air. Round the projections and groins of the front the roots of the trees above have entwined, and to a fibre of one of these, hanging down, not thicker than a whipcord, was suspended a Humming-bird's nest, containing two eggs. It seemed to be composed wholly of moss, was thick, and attached to the rootlet by its side. One of the eggs was broken. I did not disturb it, but after three weeks visited it again. It had apparently been handled by some curious child, for both eggs were broken, and the nest evidently deserted." Another nest close to the one deserted was, however, in progress, and the writer goes on to say, "While I lingered in this romantic place, picking up some of the land-shells which were scattered among the rocks, suddenly I heard the whirr of a Humming-bird, and looking up saw a female *Polytmus* hovering opposite the nest with a mass of silk-cotton in her beak. Deterred by the sight of me, she presently retired to a twig a few paces distant, on which she sat. I immediately sank down among the rocks as gently as possible, and remained perfectly still. In a few seconds she came again, and after hovering a moment disappeared behind one of the projections, whence in a few seconds she emerged again, and flew off. I then examined the place, and found, to my delight, a new nest in all respects like the old one, but unfinished, affixed to another twig not a yard from it. I again sat down among the stones in front,

where I could see the nest, not concealing myself, but remaining motionless, waiting for the bird's re-appearance. I had not to wait long: a loud whirr, and there she was suspended in the air before her nest. She soon espied me, and came within a foot of my eyes, hovering just in front of my face. I remained still, however, when I heard the whirring of another just above me, perhaps the mate; but I durst not look towards him lest the turning of my head should frighten the female. In a minute or two the other was gone, and she alighted again on the twig, where she sat some little time preening her feathers, and apparently clearing her mouth from the cotton fibres, for she now and then swiftly projected the tongue an inch and a half from the beak, continuing the same curve as that of the beak. When she arose it was to perform a very interesting action; for she flew to the face of the rock, which was thickly clothed with soft dry moss, and hovering on the wing as if before a flower, began to pluck the moss until she had a large bunch of it in her beak. Then I saw her fly to the nest, and having seated herself in it, proceed to place the new materials, pressing and arranging and interweaving the whole with her beak, while she fashioned the cup-like form of the interior by the pressure of her white breast, moving round and round as she sat. My presence appeared to be no hindrance to her proceedings, although only a few

feet distant; at length she left the place, and I left also. On the 8th of April I visited the cave again, and found the nest perfected, and containing two eggs, which were not hatched on the 1st of May."

Another nest of the same species was seen by Mr. Gosse, stuck on the twig of a sea-side grape (*Coccoloba*) about fifteen feet above the ground, almost above the sea, for as the tree grew at the very edge of the shore, the branches stretched out over the water. This nest contained two newly-hatched young, and endeavours were made to secure them, together with the parent, by means of an insect net; but all attempts proved futile, for the female was alarmed and wary. On proceeding the next day to the nest with the same object in view, the nest was found to be quite empty, no trace of the unfledged young being left. "It is probable that the bird, annoyed at being watched, had removed them on her back, a thing not without precedent."

It would appear that under similar circumstances the eggs also are removed, not, however, without risk, as the following incident will show:—

"In June I found a nest of the same species on a shrub or young tree in the Cottawood. It contained one egg. I looked at it and went a little way farther. In a few minutes I returned; the bird was sitting, the head and tail oddly projecting from the nest, as usual. I hoped to ap-

proach without alarming it, but its eye was upon me, and when I was within three or four yards it flew. I looked into the nest, but there was no egg. On search I found it on the ground beneath, much cracked, but not crushed. How could it have come there? The bush, to the main stem of which it was attached, was too strong for the rising of the bird to have jerked it out; besides which such result was not likely to happen from an action taking place many times a-day. It must, I think, have been taken out by the bird. I replaced the cracked egg, and a day or two afterwards revisited it again. The nest was again empty, and evidently deserted."

The nests of this lovely species present considerable variety, not only as respects their place of affixation, but the materials of their composition also. On the 12th of November Mr. Gosse found the nest of a *Polytmus* suspended on a hanging twig of a black mangrove tree, the twig passing perpendicularly through the side and out at the bottom. It contained two eggs, in one of which the chick was considerably advanced, while the other was freshly laid—a curious circumstance, if we are not to consider it as contrary to the general rule. This nest was cup-shaped, and mainly composed of silk-cotton, very closely pressed, mixed with the still more glossy cotton of an *Asclepias*, particularly round the edge: the seed remaining attached to

some of the filaments. On the outside the whole structure was quite covered with spider's web, crossed and recrossed in every direction, and made to adhere by some viscous substance (saliva?) evidently applied after the web was placed. Particles of pale green lichen, and fragments of thin laminated bark were stuck here and there on the outside, by means of the webs having been passed over them. This may be considered as the usual or normal mode of structure, but variations occur from local causes. For example, in the nest at Bognie cave moss only was used, and the base was produced to a lengthened point. A nest of exceeding beauty, says Mr. Gosse, "is now before me; it is composed wholly of pure silk-cotton, bound profusely with the finest web, undistinguishable except on close examination; not a fragment of lichen mars the beautiful uniformity of its appearance. Others are studded all over with lichens; and these, too, have a peculiar rustic prettiness. The situations chosen for nidification, as will have been perceived, are very various."

Speaking of the *TROCHILUS MINIMUS*, which he calls the Vervain Humming-bird, he observes, that "its season of nidification seems to be as protracted as in other species peculiar to Jamaica. The small bushes of Lantana, so common by road-sides, and always covered with orange and yellow blossom, are favourite situations for the domestic economy of this minim

bird. The smooth twigs of the bamboo are not unfrequently chosen. It is not an uncommon thing in Jamaica for a road up a mountain to be cut in zig-zag terraces to diminish the steepness; and, to prevent the lower side of such a road from crumbling away, stems of green bamboo are cut and laid in a shallow trench along the edge. Shoots spring from every joint, and presently a close row of living palisades is growing along the margin of the road, whose roots, as they spread, effectually bind together the mountain side, and make the terrace perpetual; while, as they increase in height and thickness, they throw their gracefully-waving tufts over the way, like gigantic ostrich plumes, affording a most refreshing shadow from the heat. Such a bamboo-walk, as it is called, winds up the steep side of Grand Vale Mountain, in St. Elizabeth's, and here the nests of the Vervain Humming-bird are frequently met with." These nests are, for the most part, complete cups of silk-cotton, exceedingly compact and neat, ornamented outside with bits of grey lichen stuck about. They are usually placed on a joint of a bamboo branch, and are supported by the diverging twigs, around which spiders' webs or fibres of silk-cotton are thrown, in order to afford additional security.

We have said enough to give our readers a general idea of the diversities of nidification among the Trochilidæ; in every instance beauty of structure is observable, and in some instances

singularity, insomuch that one would almost suppose that the bird was guided by reason, rather than instinct.

With respect to the eggs, they are two in number, white; but often, from their transparency, they display the colouring of the yolk, the shell appearing as if tinged with a blush of orange-red or pink. Considering the diminutive size of the birds, the eggs are large; they are a long-oval, or ellipsoidal in form, measuring from three to four-eighths of an inch in length on the average.

It would seem that these two eggs are not in all cases laid within a day or two of each other; but that sometimes the second is not deposited until the first is in a state of advancement. We have quoted an instance in point, from Mr. Gosse, relative to the eggs which, on one occasion, he found in the nest of a *POLYTMUS*. Had the nest been examined before the second egg was laid, that egg having the chick formed within it, the *POLYTMUS* might have been recorded as a species producing only a single egg; and in this way, we suspect, the idea has arisen that the *Trochilus hirsutus* never lays more than one egg for each period of incubation.

It would be interesting to learn whether, in cases where the second egg is laid long after the first, that egg is brought to perfection, or whether it is rejected when the young bird is disclosed from the first.

The young, on emerging from the shell, are naked and blind; but they thrive rapidly, the feathers soon begin to grow, and in about three weeks they are able to leave the nest. The period of incubation most probably varies in the different species; Mr. Gosse found two eggs in the nest of the Long-tailed Humming-bird, on the 8th of April, which were not hatched on the 1st of May, when the nest was taken. Captain Lyon notices that the species whose nidification he watched laid an egg on the 26th, and the second on the 28th of January, and these were hatched on the 14th of February. Audubon says that the eggs of the Ruby-throat are hatched in ten days.

The young are fed as are those of the pigeon or canary, and receive nectar and insects from the crop of the parents, their beaks being inserted into the beaks of the nestlings.

We have already alluded to the pugnacity of the Humming-birds; but during the breeding season this pugnacity is displayed to an extreme; they attack every bird which approaches their nest, darting at it with the greatest fury; but this fierceness is only confined to feathered aggressors, for as far as man at least is concerned, though they may exhibit signs of agitation or distress on his near approach, they make no attack. It is true that Fernando Oviedo asserts that they fly at the face, and strike the eyes of a person who ventures to look into their nest,

going and returning to the assault with incredible swiftness; but this is an exaggerated statement. If not molested the female will sit quietly and permit a very close approach; nay, the bird, with her nest, may be captured by means of a gauze insect-net with facility. More than this, she will work at the building of her nest while the gazer, if quiet, stands only a few feet distant. It is true that, when watched or molested, these birds, actuated either by curiosity or mistrust, and feeling confidence in their powers of flight, will hover over a person's head, or approach within a foot of his face, suspending themselves as if to scrutinise the countenance. When struck at, as they dart along, they will wheel round, and inquisitively hover in front of the person's face, as if to demand the reason of such usage; and we agree with Mr. Gosse, who says,—"The stories told of Humming-birds attacking men and striking at the eyes with their needle-like bills originated, I have no doubt, in the exaggeration of fear, misrepresenting this innocent curiosity."

If much disturbed on the nest, as we have seen, the Humming-bird will remove her young or her eggs. In this there is no singularity. The Carolina Goatsucker (*Caprimulgus Carolinensis*) does the same. Audubon says,—“Should you touch or handle the eggs, and returning to the same place search for them again, you would search in vain, for the bird perceives at once

that they have been meddled with, and both parents remove them to some other part of the woods, where chance only could enable you to find them again. In the same manner they also remove the young when very small." The eggs, as Audubon ascertained by patient watching, are carried off in the mouth. The same observations apply to our British Goatsucker; and it is not improbable that other species of birds may act in a similar manner.—See also Wilson's account of *Caprimulgus vociferus*. Let us here be not misunderstood; we do not mean to affirm that every species of Humming-bird will, when the nest is disturbed, remove its eggs or its young; but that this is occasionally done by the POLYTMUS, is, we think, sufficiently attested. It is said that the White-crowned Pigeon of Jamaica (*Columba leucocephala*) will, if twice driven by intrusion from her nest, remove the young, leaving the nest empty, to the disappointment of the self-congratulating spoiler.

All birds with wings formed for rapid darting flight, and perhaps especially those whose plumage is burnished or lustrous, dart, as soon as fully fledged, from their "procreant cradle," and wing their way with as much skill and adroitness as their parents. By way of familiar examples, we may adduce the Swift, the Swallow, and the Kingfisher. Captain Lyon, as we have seen, states that the young Humming-birds, whose progress he watched, darted at once from

the nest without previous practice, and flew as swiftly and vigorously as the parent. Mr. Gosse, speaking of a Humming-bird which he reared, says,—“When nearly full grown, it would rear itself up, touching the nest only with its feet, on tiptoe as it were, and vibrate its wings as if hovering in flight, for minutes together; at length it fairly took its flight out of the window.” In the case of gallinaceous birds, whose main progressive power is in the legs, we find a parallel; the chick of the common fowl, the Pheasant, or Partridge, shortly after exclusion from the egg, finds the use of its limbs, and runs about with celerity. Here feathers (as in the case of wings) are not needed; still the parallel holds good,—for the wings being the great organs of progression in the Humming-birds, they are brought into action as soon as developed, their development being connected with the growth of the feathers. The leg of the Partridge gains strength within a few hours after exclusion from the shell; and in each instance, according to the nature of the bird, the organ of progression first developed is that which is first brought into exercise. Between the birds which trust principally to the wing, and those that trust principally to the feet, there are multitudinous grades and modifications.

The possibility of keeping Humming-birds in confinement, and the possibility of bringing

them as captives into England, are two points which have engaged the attention of many ornithologists. Now, it is well known that, some years ago, a female MANGO HUMMING-BIRD, sitting upon two eggs, was captured, with the nest, that she hatched the eggs on shipboard during the passage of the vessel from Jamaica, and soon died; that the young were brought to England, and committed to the care of Lady Hammond; that one died in a very short time, and the other in about two months. The mere possibility, therefore, of bringing home these lovely birds is demonstrated; but their preservation is quite another question. It cannot be effected.

With regard to the possibility of keeping them in confinement in their native regions, although attempts to effect this have been partially successful, the result has ever been a failure. As far as migratory species are concerned, little hope of success can be entertained; for we know the difficulty with which our own migratory birds can be preserved in active health, even in the best-regulated aviaries. The instinctive pining for change of habitat suffices to destroy life.

But, referring to non-migratory *Trochilidæ*, the great difficulty in furnishing an abundant supply of insect food, is the chief cause of failure. It is true that these birds imbibe nectar, and will drink honey or sugar and water; but they cannot subsist on such a diet alone, at least

for any great length of time. They require insects, of which, when in their natural state of freedom, they devour great quantities; in fact, their stomach, when examined, is always found to be replete with insect debris, and as digestion proceeds the supply is incessantly kept up. Indeed, when we consider the expenditure of muscular energy, for these birds are almost always on the wing, darting to and fro, we shall at once see the necessity of ample refection, both as it regards solid and liquid aliment. But liquids alone will not maintain life for any length of time, or a vigorous condition, and death from starvation sooner or later takes place. Of this fact Mr. Gosse repeatedly convinced himself; for he found, on dissecting his captives which died, that they were exceedingly meagre in flesh, and that the stomach, which is ordinarily as large as a pea, and distended with insects, was, in these birds, shrunken to a minute collapsed membrane, with difficulty distinguished.

An abundant supply of the flowers which the captives are found, by experience, to prefer, these being repeatedly changed for fresh, from which nectar and insects may be obtained in sufficient abundance, affords the best chance of success; but this can only be done in their native localities, and then moreover not without considerable trouble. But, in our island, granting that a few survivors out of numbers captured in Jamaica, reached our shores, what in the way of food

should we have to offer them? Honey in abundance; but, as for the peculiar insects upon which each species feeds, insects which affect certain flowers, neglecting others—whence it comes that one species of bird is attracted to one or more kinds of flowers, and passes by many attractive to other species:—as for these insects, we say, we can offer no substitute.

Mr. Gosse, however, seems to think that Humming-birds might, with due precaution, be transported to our island, and be preserved alive. Such is not our opinion. However, we ought in fairness to listen to his plan as he details it.

“I would have a very capacious cage wired on every side, in the bottom of which a supply of *decaying* fruit, such as oranges or pines should be constantly kept, but covered with wire, that the birds might not defile their plumage. This, as I have proved, would attract immense numbers of minute flies, which, flitting to and fro in the cage, would *probably* afford sufficient sustenance to the birds in conjunction with the syrup. The birds, however, should be caged as short a time as possible before sailing, which might be early in May, and by a steamer, which calling at St. Thomas, Bermuda, and the Azores, large bunches of fresh flowers and even herbage might be obtained at short intervals on the voyage, with which, of course, a multitude of insects would be introduced. Thus, I still think, these

lovely birds might be introduced into our conservatories and stoves, where there would be no difficulty in preserving them. Mr. Yarrell has suggested to me, that possibly young ones fed from the nest upon syrup alone might be able to live without insect food."

Now, granting that out of a large number of individuals some survived the voyage, we again ask, what congenial insect food even in our finest conservatories can be obtained by these birds, however spacious the cage in which they are imprisoned, nay, even though the conservatory itself be their range? With respect to the idea suggested by Mr. Yarrell, we doubt the eventual success of the plan. Syrup may barely support a young Humming-bird for some time, but it will at last die exhausted and emaciated.

We do not know whether Humming-birds were kept in the grand aviary of Montezuma; most probably they were; and if so, we should be the less surprised at the number of attendants recorded to have been employed in that vivarium, for the very duty of collecting fresh flowers of different kinds for the supply of these birds must have given employment to a considerable party. Unless this supply was afforded, the aviary, as far as the Humming-birds were concerned, would soon have been tenantless.

It may not be uninteresting to record some of the experiments which have been made with a view to the preservation of certain of the Tro-

chilidæ in captivity, and the more so as they throw a considerable light on the habits and economy of these lovely birds.

According to Labat, Father Montdidier kept Humming-birds for the space of five or six months in his apartment, where they brought up their young; and Azara states that Don Pedro de Melo, Governor of Paraguay, kept an adult Humming-bird for many months: it became so tame as to fly round him for food. It was fed ordinarily on syrup, but fresh flowers were from time to time presented to it. It died at last, as is asserted, through the negligence of a servant. But we will come at once to modern times.

Mr. Bullock states, that while in Mexico he had at one time nearly seventy in cages, which with care and attention he kept living for some weeks, and he adds that he has no doubt of the possibility of bringing them alive to Europe. "The accounts of their being so fierce and untameable as to beat themselves to death when confined are not true; no bird is more easily reconciled to its new situation. It is true they are seldom off the wing, but they never strike themselves against the cage or the glass of a window; they remain, as it were, suspended in the air, in a space barely sufficient for them to move their wings, and the humming noise proceeds entirely from the surprising velocity by which they perform the motion. In each cage was placed a small

earthen cup about half filled with sugar and water, of the consistence of thin syrup; in this various flowers had been inserted, principally the bell-shaped corolla of the great Aloe (*Agava Americana*), the end of which next the stem being cut off, permitted the liquid to flow into the flower; into this the little prisoners were constantly inserting their long bifid tongues, and drawing up its luscious contents. This operation, like most of the actions of the bird, was generally performed on the wing; but they sometimes alighted on the flower, perching against its sides in an upright position, and pumping up the mucilaginous liquid."

There is a great difference in the conduct of Humming-birds under confinement; all are by no means so contented as Mr. Bullock would lead us to infer; sometimes they flutter violently about in great agitation, and do not easily become reconciled, and sometimes they pine moodily, and soon die. Mr. Gosse captured a MANGO HUMMING-BIRD which beat itself to death.

Audubon, in his account of the Ruby-throated Humming-bird, a migratory species, tells us that he has seen many of these birds kept in partial confinement, when they were supplied with artificial flowers made for the purpose, in the corollas of which water, with honey or sugar dissolved in it, was placed. They were fed upon this diet exclusively, but seldom lived many months, and, on being examined after death, were found to be *extremely emaciated*. Others,

he states, which were supplied twice a day with fresh flowers from the woods or garden, placed in a room with windows closed merely with mosquito gauze-netting, through which minute insects were able to enter, lived twelve months, at the expiration of which time their liberty was granted them. The room was kept artificially warm during the winter months, and a growing orange tree was also placed in it. This was in Lower Louisiana, where ice is seldom produced in the winter. Mr. Audubon further observes, that although he has occasionally seen these birds confined in the middle districts of the States, he has never ascertained an instance of one surviving the winter.

Mr. Gosse made several attempts to rear the LONG-TAILED HUMMING-BIRD from the nest, and on one occasion with success; and it is remarkable that in each instance the nest contained only a single young one. On the 20th of May, 1846, he obtained the nest of one of this species, which was affixed to a twig of sweetwood (*Laurus*). It contained a young one unfledged, the feathers only budding. At first it was fed with sugar dissolved in water, which it readily sucked from a quill many times in the course of the day: occasionally mosquitoes and other small insects were put into the syrup, and these it seemed to like, but particularly ants, which crowded into the sweet fluid and overspread its surface. The quill would thus contain a dozen at a time, which were sucked in with

much relish. It throve manifestly, and the feathers grew apace ; and on the 29th of the same month, it was almost ready to leave the nest. On that day, however, it unexpectedly died. Mr. Gosse, however, procured another young one, which he reared under similar circumstances until it was actually fledged. When nearly full grown it began to exercise its pinions, vibrating them while resting on the edge of the nest, and ultimately took its flight out at the window. Had no insects been afforded, we doubt not that the bird would have died.

Easily as adult Humming-birds are captured by means of a gauze-net, their curiosity leading them to hover over the mouth and peep into it, yet, as far at least as the *Polytmus* is concerned, it is no easy matter to convey them to a place of security. Mr. Gosse found that those he thus captured, though neither struck nor injured in any way, were usually either dead, or in a dying state, by the time he arrived at his house ; and that the few which did arrive at the house in apparent health mostly died the next day. They did not beat themselves against the cage, but sunk under the misery of confinement. They would suddenly fall to the floor of the cage, and lie motionless with closed eyes ; if taken into the hand, they would perhaps seem to revive for a few moments, then throw back the head, or toss it to and fro as if in great suffering, puff up the feathers of the

breast, and die, usually without any convulsive struggle.

Mr. Gosse was not, however, always so unsuccessful. On one occasion, in November, he captured two young males, while they were sucking the pretty pink flowers of *Urena lobata*. These were brought home in a covered basket, and not caged, but turned into an open room. They were lively, but not wild, playful towards each other, and so tame and fearless as to come and sit on the finger. A few flowers were collected and placed in a vase on a high shelf, and to these they resorted immediately; but to none did they pay any attention except to *Asclepias curassavica*, and slightly to a large *Ipomea*. On seeing this, Mr. Gosse went out, and gathered a large bunch of *Asclepias*. "I was pleased," he says, "to observe that, on the moment of my entering the room, one flew to the nosegay and sucked while I held it in my hand. The other soon followed, and then both these lovely creatures were buzzing together within an inch of my face, probing the flowers so eagerly, as to allow their bodies to be touched without alarm." These flowers were placed in another glass, and the birds visited each bouquet in turn, now and then flying playfully after each other through the room. Occasionally they flew against the window, but did not flutter or beat themselves against it. As they thus flew about, the snap of their beak was frequently heard,

indicating the capture of some very minute insect.

After a short time one of these birds, from some unexplained cause (perhaps it had struck itself during its flight), sunk down, evidently in a dying state, and shortly afterwards expired. The other continued active and lively. The flowers, however, were soon exhausted; perceiving this, Mr. Gosse says,—“I prepared a tube, made of the barrel of a goose-quill, which I inserted into the cork of a bottle to secure its steadiness and upright position, and filled it with juice of sugar-cane. I then took a large *Ipomea*, and having cut off the bottom, I slipped the flower over the tube, so that the quill took the place of the nectary of the flower. The bird flew to it in a moment, clung to the bottle rim, and bringing his beak perpendicular, thrust it into the tube. It was at once evident that the repast was agreeable, for he continued pumping for several seconds, and on his flying off I found the quill emptied. As he had torn off the flower in his eagerness for more, and even followed the fragments of the corolla as they lay on the table to search them, I refilled the quill, and put a blossom of the *Marvel of Peru* into it, so that the flower expanded over the top. The little toper found it again, and after drinking freely withdrew his beak; but the blossom was adhering to it as a sheath. This incumbrance he presently got rid of, and then he re-

turned immediately, and inserting his beak into the bare quill finished the contents. It was amusing to see the odd position of his head and body as he clung to the bottle, with his beak inserted perpendicularly into the cork. Several times, in the course of the evening, he had recourse to his new fountain, which was as often replenished for him; at length, about sunset, he betook himself to a line stretched across the room for repose. I found him active before sunrise, having already visited his quill of syrup, which he emptied a second time. After some hours he flew through a door which I had incautiously left open, and darting through the window of the next room escaped."

With great perseverance, which only the ardent feelings of the true naturalist could have inspired, Mr. Gosse continued his experiments; and, on the 22nd of May, he received three males of the *POLYTMUS* from the Bluefield Peak. These were turned into a room, and at once became familiar; and one of them, which appeared the boldest, found out immediately a glass of sugar-syrup and sipped repeatedly at it. One of these birds disappeared the next day, having, it was supposed, fallen into some corner behind the furniture. The others, however, were quite at home; one, indeed, shortly became so fearless and inquisitive, as to fly to the face of its owner, perch on his lip or chin, and to insert its beak into his mouth, sometimes annoying him by the

frequency of its visits and its pertinacity. Bouquets of fresh flowers were procured for them ; but these they did not much regard, though one or two species of *Lantana* seemed to be more attractive than the rest. The honied and fragrant bunches of blossom of the *Morenga*, which, while on the tree, prove so attractive, also tempted the captives, but were soon neglected ; probably because they were at the time destitute of nectar, or perhaps because the syrup-glass gave a more copious draught. To this glass they always clung with the feet, and often to the flowers also. It happened that there were lines stretched across the room, for the purpose of drying specimens of natural objects, skins, &c. On these lines each selected his own roosting place, at some distance apart, and invariably kept to it. They had also their own peculiar stations for alighting and taking a temporary rest ; and so pertinaciously did they adhere to these stations, that they disputed every attempt to make them change the place, evincing distress by hovering round the interdicted spot, and making every endeavour to alight. To this predilection of the Humming-birds for a particular twig on which to perch, allusion has been previously made. It is observable in other birds, as the Flycatcher of our island, the Kingfisher, &c.

Of these two Humming-birds the boldest was inclined to be pugnacious and overbearing, occasionally attacking his gentler companion, who

yielded and fled; the victor would then resort to his perch, and utter a succession of shrill chirps, "*screeep, screeep, screeep,*" as if in triumph. In a few days, however, the gentler bird plucked up courage, vigorously resisted, conquered, and played the tyrant in his turn, interdicting his former oppressor and fellow captive from sipping at the sweetened cup. Twenty times in succession would the thirsty bird sweep down from his perch to the glass; but no sooner was he poised before it than the other would dart down with inconceivable rapidity, and wheeling so as to come up beneath him, drive him away from his repast. An approach to the cup was the signal for an instant assault; but he might fly about as he pleased elsewhere without molestation. All this time the victor, once the vanquished, would visit the cup, and take long and frequent draughts, no doubt to the mortification of his rival. With his recovered boldness he regained voice, and both would *screeep* pertinaciously and shrilly, almost without intermission. When they were accustomed to the room, they indulged in the exuberance of vivacity, manifested by their upright posture, their quick turns, and the flashing of their lovely breasts from darkness into sudden lustrous light, like rich gems,—by their dartings hither and thither, and their most graceful evolutions in the air. So rapid were these, that the eye was frequently baffled in attempting to follow their motions. "Suddenly," says Mr.

Gosse, "we lose the radiant little meteor in one corner, and as quickly hear the vibration of his invisible wings behind us, or find him hovering in front of our face, without having seen in the least how he came there. It is worthy of observation, that POLYTMUS in flying upward keeps the feathers of the tail closed, but in descending they are expanded to the utmost, at which time the two long feathers, quivering with the rapidity of their motion like a streamer in a gale, form about a right angle. I cannot tell why there should be this difference, but I believe it is invariable."

From the 23rd of April to the end of May, Mr. Gosse informs us, that he obtained about twenty-five more living specimens, nearly all males, most of which were captured on the Bluefields Ridge. Some were taken with a net, others with birdlime. Of these specimens, however, many died before they could be conveyed home, and many, although alive, were in a dying state. They did not beat themselves against the sides of the cage or basket, and had received no injury, but, from the wild look of those which were brought alive, sitting on the bottom of the cage, gazing upwards, it was evident that extreme terror had given the fatal shock. Of those who recovered from the first shock, and were turned into the room, several more died within twenty-four hours, by dashing and fluttering against the walls, till at length they sunk exhausted, either

on the floor or behind boxes and lumber. Out of the twenty-five, only seven were preserved. These, however, soon became tame, and quite at home; at the same time, they exhibited much difference in temper and disposition; some were moody and sulky, others very timid, and others gentle and confiding from the first. Mr. Gosse details the mode in which he reconciled them to their prison, and invited them to take syrup—a mode in many cases requiring the exercise of much watchfulness, patience, and gentleness, especially with moody or timid birds, which are induced, not without difficulty, to perch and drink.

As soon as a bird became accustomed to the room, familiarized to drink at the syrup cup, and voluntarily sought its perch, it was considered to be domesticated—if endurance of confinement can be called domestication. The prisoner, however, made the best of circumstances; its time was passed in incessant short flights about the room, alternating with momentary rests on the line, sometimes two were seen to dart on the wing towards each other, as if in playful hostility. The chief object of these incessant sallies on the wing, was evidently the capture of insects; sometimes the capture of the insect was discernible, but in other cases, though the snap of the beak might be heard, the insect taken was too minute to be distinguishable by the naked eye; the determinate action of the bird demonstrated the

motive by which it was influenced. Not unfrequently, as all must have witnessed in our common fly-catcher, the Humming-bird would dart from its perch, take a short sweep, and having captured its prey, return again to its post of observation. Mr. Gosse supposes that, on a low estimate, three insects are taken per minute, and that, with few intervals, incessantly from dawn to dusk. He does not think that the bird in a state of freedom takes so many in the air, inasmuch as the blossoms afford it an ample supply, at the same time they are to be perpetually seen *hawking* in the air. Three flies taken per minute, granting a minute's rest after each pursuit, would give us ninety flies per hour, or five hundred and forty insects captured in six hours. Well might a distinguished ornithologist observe to us, during a conversation as to the possibility of bringing Humming-birds to England and rearing them in captivity, "They eat their own weight of insects daily."

Mr. Gosse observed, that his captives would occasionally fly to the walls, and pick from the spiders' webs with which they were draped.

While resting on their perch, these birds habitually sat in a nearly upright posture, the head being thrown back, the crimson beak slightly elevated, the abdomen depressed, and the feet almost concealed; at the same time the tail was deflected, the long feathers crossing each other about the middle. On descending to drink from

their reservoir, instead of flying in a direct line, "which would have been far too dull for the volatile genius of a Humming-bird," they made a dozen or twenty distinct stages, in a series of downward curves and risings, hovering at each ascent, and then, often making several horizontal traverses, before they would bring their feet to the glass, and insert their suctorial tongue. It was not till dusk that they desisted from *hawking*, and retired to roost; and when settled for the night, they were restless and easily disturbed, taking to the wing on the entrance of a person with a candle, and fluttering about in bewilderment. In an evil hour, Mr. Gosse determined to transpose his captives from the freedom of a room into a large cage with a wired front. By degrees, and by means of the syrup cup he coaxed them in, and at length closed the grate. "After I had shut them in," he says, "they beat and fluttered a good deal, but the next day I was gratified to find that all had taken their places quietly on the perches, and sipped at the syrup, though rather less than usual. I had now hopes of bringing them alive to England, thinking the most difficult task was over, especially, as within a day or two after, I added to them two more males and a female." But these hopes were blighted, the female by accident escaped, and the rest, after they had been in the cage but a week, began to die, sometimes two in a day, in another week, only a solitary individual was left,

which soon followed the others. They were debarred from insect food, and perished for want of sustenance. Such, we suspect, will ever be the fate of caged Humming-birds.

Mr. Gosse was equally unfortunate in his attempts to rear or domesticate the *VERVAIN HUMMING-BIRD*. Several times he enclosed a nest of eggs in a gauzed cage, taken with the dam in the act of sitting; but she always forsook the nest, took no notice of the eggs, and in no case survived for twenty-four hours. Some which he captured were turned into a room; but their timidity was extreme, and nothing could be done with them.

Speaking of the mode of flight of this species, he observes, that its wings vibrate with such extraordinary velocity as to be visible only as a semicircular film on each side. "Neither of our other species approaches either the rapidity or extent of this oscillation; and hence, with this bird alone (as regards the Jamaica species) does the sound produced by the vibration of the wings acquire the sharpness of an insect's hum. The noise produced by the hovering of a *POLYTMUS* is a whirring exactly like that of a wheel put into rapid revolution by machinery. That of the *VERVAIN* species is a hum like that of a large bee."

So far have we attempted to give a general idea of the habits and economy of the *Trochilidæ*. In certain points there is a common agreement, as, for example, rapidity of flight, insectivorous appetite, and duality and colour of eggs.

But in other points the difference is considerable, to say nothing of size. They differ in the development and form of the wings, and with this is associated corresponding modifications in the style and character of flight; they differ in the development of the feet, which in some species are much more robust than in others; and as a rule, the feet are particularly small in such as are most gifted in the powers of flight. Where the feet are large, the wings are reduced, but the facility of clinging is increased. In some species the tarsi are covered by a full muff of most delicate down.

The tail, an organ of great importance in flight, presents numberless and opposite modifications of form, of expansiveness, of abbreviation, or elongation, and hereby also is the style of aerial progression affected. Every one who has observed the evolutions of the Swift, the Swallow, the Martin, and the Sand-martin, birds rapid on the wing, cannot but have remarked that each has its own style of flight, by which, irrespective of anything else, the species may be at once determined. In each of these birds, not only the wings, but the tails also, are differently modified—a point on which we need not dilate. But very far greater is the modification of these organs amongst the Humming-birds; greater, therefore, must be the differences in their style of flight, and its ordinary degree of aerial elevation; this being brought to harmonize with the

localities frequented, and the position of the flowers which are most attractive. Many species, like our swallow, are fitted either for darting through the air at a great altitude or close along the flowery plain. But the wings of the VERVAIN HUMMING-BIRD, which flits like a bee from flower to flower, over the pasture lands, and along banks and hedgerows, would not fit it for dashing round the rocks and pinnacles of the Cordilleras, or for passing, like the RUBY-THROAT, from Northern Canada to the Intertropics, and back again, on a long migratory expedition.

Those who have gained a familiar acquaintance with a certain number of the species of the *Trochilidæ*, can at once distinguish between them while on the wing; as readily, in fact, as we can between our different species of *Hirundo*. To a practised ear, the very murmur of the wings is sufficient.

With respect to gorgets, crests, and ornamental plumes, there is no limit to variety; here nature appears to indulge in most fantastic luxuriance. We can scarcely suppose that these ornaments are not destined to answer some important purpose, but we are ignorant as to what that purpose is.

As much, as in ornaments, does variety prevail in the form and length of the beak; but here we can trace, to some extent at least, a definite reason; peculiar kinds of flowers require a different kind of probe; and hence, as this probe is the

beak, so must its construction be modified according to the conformation of the blossoms from which any species respectively is destined to draw its sustenance.

We do not learn that any Humming-birds are social or gregarious, as are the Weaver-birds of Africa and India, and so many of our native species; but vast numbers are sometimes seen in company together, attracted by some favourite object to a common focus. Mr. Gosse states that two large tamarind trees near his house, in full blossom, proved such a centre of attraction to the VERVAIN HUMMING-BIRD. They flocked together like a swarm of bees intent upon the flowers, and the air resounded with their humming as if in the neighbourhood of a hive. None, however, establish colonies, or build their nests in social groups, or act together. Individuals or pairs pursue an independent course. Multitudes may, indeed, sometimes be seen darting about on rapid wings, as in the case of our common Swallow (*Hirunda rustica*); but for all that, the Swallow cannot be said to be social in its habits; for each pair nidificates apart from any other. The House-martin is social, to a great extent at least, and the Sand-martin more so.

Most, if not all, migratory birds congregate together before the time of departure, and so united pursue their course: the Swallows, the Wheatears, the Quails, and many more, might

be adduced as illustrative examples. It does not, however, appear that the Nightingale, the Blackcap, the Redstart, and a few others, perform their migrations in associated numbers; at all events, flocks of these birds on their route have never been seen, nor can we learn that flocks of any migratory species of Hummingbird have ever been met with. Wilson, who gives an admirable account of the RUBY-THROAT, merely records the dates of its appearance at Savannah, in Georgia (23rd of March); in the county of Burke, in Pennsylvania (25th of April); and the interior of Canada, where he says it is seen in great numbers. He expresses his wonder at the extent of migration performed by so minute a species; but he says nothing which leads us to infer that it congregates for the purpose of migration. At the same time it is not unlikely that it may do so in small flocks, consisting of ten or twenty individuals. This seems to be the opinion of Audubon, who believes that the young broods associate together, and perform their migration apart from the adults; but he only founds this opinion on the fact, that he had seen twenty or thirty young birds resort to a group of trumpet flowers, when not a single old male was to be seen. He does not say that he ever observed any flocks in the course of their migratory movements; and he was never able to assure himself whether they migrate during the day or night; but he ob-

served that they passed through the air (whether on their journey or not, or whether in flocks or not, he does not say) in long undulations.

We suspect that migration is performed by individuals united by a common impulse into small flocks, which wing their way northwards, or southwards, by stages, according to the season.

We extract the following passage from an able article in the Penny Cyclopædia, relying on the correctness of references to works not easily accessible, and not, in general, of great intrinsic value:—"It is not to be wondered at that fable should have its share in accounting for the origin and describing the habits of these diminutive aerial beings. Thus, while the more sober believed that they were hatched from eggs, like other birds, others fancied that they were transformed from flies, some going so far as to declare that they had been seen in the half-fly half-bird state." Truly the naked blind dusky specimens of young nestlings in Mr. Gould's collection look almost as like flies as birds. To proceed. "Then, again, they were supposed to live no longer than the flowers which afforded them food; and, when those flowers faded, they were believed to fix themselves by the bill to some pine or other tree, and there remain during the dreary months till the descending rains brought back the spring, when they revived again to undergo the same alternation of

life and death. Gomara states, that they expired in the month of October, having previously suspended themselves by a branch in some warm place, and were renascent in April. Instances were cited where they had been kept affixed to some stick within doors, and after lying lifeless for six months had become reanimated, and being given their liberty had flown forth into the fields. This is related as worthy of all credit in the edition of Hernandez (Romæ, 1651, p. 322, folio). John de Laet quotes Ximenez for the story of their remaining affixed by their bills, and there remaining immoveable like dead birds for six months, till the rains returning Flora again decked the fields.—(Novus Orbis, fol. Lugd. Batav. Ed. Elzever. 1633, page 256)."

Any comment on this tissue of fable and credulity is as useless as would be, in the present day, any serious attempt to refute the once entertained theory of the subaquatic hybernation of swallows. Erroneous opinions often arise from circumstances, which give them something like a colouring of truth ; as the acrid humour exuding from the cutaneous glands of the Toad, has led to the belief of its being a poisonous reptile ; or the attendance of the insect-eating Goatsucker on cattle to the supposition that the bird drained their udders. It strikes us that the following observations by Wilson, which have attracted little notice, bears upon the story

of Humming-birds clinging in a deathlike trance to some object during winter :—

“ This little bird, viz. the RUBY-THROAT, is extremely susceptible of cold, and if long deprived of the animating influence of the sunbeams soon droops and dies. A very beautiful male was brought to me this season—1809, which I put into a wire cage, and placed in a retired shaded part of the room. After fluttering about for some time, the weather being uncommonly cool, it clung to the wires and hung in a seemingly torpid state for a whole forenoon. No motion of the lungs could be perceived on the closest inspection, though at other times this is remarkably observable ; the eyes were shut, and when touched by the finger it gave no signs of life or motion. I carried it out to the open air, and placed it directly in the rays of the sun in a sheltered situation. In a few seconds respiration became very apparent, the bird breathed faster and faster, opened its eyes and began to look about with as much seeming vivacity as ever. After it had completely recovered I restored it to liberty, and it flew off to the withered top of a pear-tree, where it sat for some time dressing its disordered plumage, and then shot off like a meteor.” It is an undoubted fact that benumbed Swallows, Cuckoos, and Land-rails have been found in our island during the winter months concealed, for the sake of shelter, in obscure retreats, half starved, half dead, but

not truly hybernating. However, from a few isolated cases like these, many have insisted on the hybernation of such species, overlooking the fact, that some accident had prevented their migration at the ordinary time, and that cold and famine were bringing them to their end, their timely discovery being a mere matter of accident, and but for which their death must have speedily occurred. Now, may not a few wretched Humming-birds, prevented from migrating by some fatality, benumbed perhaps by an unexampled and sudden depression of atmospheric temperature, have been occasionally found clinging to the sprig of some bush or tree, as a place of refuge, and given rise to an exaggerated story, greedily received, modified, and added to; the marvellous being, as we know, exceedingly palatable, and credited upon very slender testimony by persons not conversant with the laws of organic life? Witness the stories of live toads having been found inclosed in the centre of a solid block of marble or compact stone, and which have raised vague wonder in the minds of persons even of education in the nineteenth century, who have firmly believed in them.

It is thus that we attempt to account for the marvellous accounts given by Gomara, Ximenes, and others, relative to the strange hybernation of the Humming-birds.

We are not aware that the average degree of the animal heat of these birds has ever been

ascertained. All birds have their animal temperature at a high ratio ; and in the *Trochilidæ*, so remarkable for the comparative size of the heart, for the strength and rapidity of respiration, — for the extraordinary power of the muscles of locomotion, their incessant labour, their capability of constant exercise during successive hours without fatigue, — and for the nervous energy of the system, we cannot doubt but that animal temperature is at a maximum. If this be so, it is not unreasonable to imagine that it will enable these birds to endure a degree of cold against which, from their tiny delicate frame, they would seem incapable of struggling. That this is the case with some of the most sylphlike of these beings, the dainty Ariels of their race, has been already shewn. At the same time, the power of the vital forces in counteracting the influence of cold differs, we conjecture, in various species, and also according to an abundant or scanty supply of food, in the same species. We cannot agree with those who imagine that the soft, thick, downy nests which these birds generally construct are thus designed to furnish as much warmth as possible, on the supposition that the body of the parent being so small, the quantity of animal heat given off must be in proportion. The Humming-bird, in her deep soft nest, covers only two eggs, and that to these her body affords sufficient warmth we may conclude from Captain Lyon's account,

already quoted, since he tells us that he witnessed the hatching of the eggs of a species at Gongo Soco (a mountain district) in a shallow unfinished nest, a heavy rain pouring down for several days and nights, while the mother was sitting. We believe that the temperature required for the development of the chick in the egg will be found to differ in a few degrees only among all birds which incubate (some in Australia do not incubate, but put their eggs into hotbeds of their own making). Why, then, should we suppose that the quantity of animal heat given off from the body of the Humming-bird is not sufficient for two eggs, seeing that in our country the Tits will hatch many eggs,—some species ten, twelve, or more? The Kingfisher in its dark damp hole hatches six or seven. The body of the Longtailed Titmouse (*Parus caudatus*) is not so large in proportion to the number of its eggs (ten or twelve) as is that of the Humming-bird to its dual number.

The nests of the Humming-birds are deep, if not domed, but in some species they are domed; but, whether domed or not, the end aimed at, instinctively, by their thickness, softness, felted character, and the materials employed, is the prevention of the influence of active electricity upon the eggs, which would immediately destroy the germ. And here we must quote a letter of singular interest, from R. Hill, Esq, to the Zoological Society of London, dated Spanish Town,

Jamaica, July 28, 1841. This we do the rather, as our ornithologists in general have not given to it the attention which it merits, for the relationship between nests and the electrical condition of the atmosphere is a point which we have seldom heard discussed.

“Naturalists have remarked that in tropical climates there are a greater number of birds that build close nests than in the temperate climate of Europe. In the West Indian Islands, with the exception of the Pigeon tribes and the Humming-birds (which latter build deep, thick, cottony nests), the nests are almost uniformly circular coverings of dried grass, varied by intermingled cotton, moss, and feathers, with an opening from below, or an entrance at the side. The Banana-bird weaves a hammock of fibres, sometimes of horse-hair, deep and purselike, and loosely netted; the *Muscicapa olivacea* (a fly-catcher), a hanging cot of withered leaves, straw, moss, fibrous threads, and spider’s webs fitted together; and the Mocking-bird builds in the midst of a mass of wicker-work a neat nest of straw lined with hair. The Woodpecker and the Parrots take to hollow trees; but I hardly know any arboreal bird beside which constructs any nest that is not wholly covered or domed over. Very many insects that are exposed to the air during their metamorphoses weave coverings of silk and cotton, in which they lie shrouded, at once impenetrable to moisture, and

uninfluenced by the disturbances of the atmosphere. It would seem that the object, whatever it be, is the same in both. It is not for warmth that the insects spin these webs, for they form their coverings of silk and cotton in the hottest period of the year: and I find that, whilst all our birds that build open nests (the Humming-birds build in May, June, and later) breed early; those that construct the domed and spherical ones nestle in the season between the spring and autumnal rains, when the air is saturated with electricity, and is in a state of constant change.

“The destructive influence exercised by the active electricity on the eggs of birds, accords with that organic gradation by which the higher embryonic animals commence vegetative life with an organization similar to that of the lower. The successive stages of development presented by the egg during incubation exhibit the heart and great vessels, constructed like those of the Batrachian Reptile, with reference to a branchial circulation. In the descending scale of organization, in animals where the respiration is low, and the irritability high, the electric stimulus is rapidly fatal. Fish and crustacea perish in numbers under the influence of a thunder-storm, and the half-matured embryo in the egg is destroyed by the disturbances which prevail during the activity of the summer lightning.

“Electricity being entirely confined to the

surface of bodies, and the quantities they are capable of receiving not following the proportion of their bulk, but depending principally on the extent of surface over which it is spread, the exterior of bodies may be partially or negatively electric, while the interior is in a state of perfect neutrality. Under isolation, the quiescent state of the electricity occasions no sensible change in their properties. The power of retaining the electric fluid depending upon the shape, and the sphere and the spheroid retaining it readily, while it escapes from a point, or is received by a point with facility, the enveloping the eggs of birds in dried and non-conducting materials spread entirely and widely round is a means of steadily maintaining a uniform distribution of the electricity, and with it of preserving that state of quiescence, by which no sensible changes are communicated to the embryo within. Thus, at a time when the air is excessively disturbed by explosions of lightning and the shocks of thunder-storms, the business of incubation is carried on in a space completely isolated, and the egg suffers no change of property by the varied electric action that is prevailing in the free atmosphere around." — *Proc. Zool. Soc.* 1841.

Here, we think, we have an explanation of the reason why the nests of the Humming-birds, though not domed, are made so deep and so thick, are so closely felted, and are fabricated

with non-conducting materials. The rim of the nest always turns inwards, so as to apply itself closely to the body of the parent while sitting on her eggs; and we have seen that she performs her task most assiduously during heavy rains, which, in the intertropics, are connected with electric changes in the atmosphere. At the same time, as the Humming-birds generally breed at an early season of the year, when the air is less saturated with electricity than it is at a later period, there is the less necessity for the additional security of a dome. Every nest will, of course, husband the animal heat given out from the body of the parent during incubation,—but this applies generally; and we have no reason to suppose that the body of the Humming-bird imparts so little heat to her two eggs, as to render the thickness and depth of the nest on that account more especially necessary: and we think that the reason may be better explained on the theory proposed by Mr. Hill,—a theory applicable more or less directly to all the soft, mossy, or downy nests of arboreal birds, which thus subserve two purposes, they husband the nest generated by the parent during incubation, and act as non-conductors of electricity when thunder-storms disturb the atmosphere. In domed nests the isolation of the eggs is the most complete.

Considering that the Humming-birds never lay more than two eggs, the abundance of cer-

tain species respectively in their favourite localities, where they are sometimes seen in swarms, cannot but be a matter of surprise. But this surprise will be diminished when we reflect that, whatever natural enemies these birds may have, their aerial dexterity, and their rapidity of flight, conjoined with a prompt and pugnacious spirit, render them secure from the attacks of birds of prey, of predatory quadrupeds, or of snakes. Man is their great destroyer, as a splendid cabinet of these birds will strongly enforce upon the mind. In fact, the Humming-bird is safe from the Hawk, and, as it never descends to the ground,* from every creeping thing; it is, indeed, inclined to presume upon its powers of wing,—it gives chase to the Tyrant Flycatcher, and hurries the Blue-bird and the Martin to their boxes. Hence, though man may occasionally thin its numbers, these are not so decidedly diminished as would be the case if it were obnoxious to destruction from the assaults of many predatory creatures. Again, the small size of the nests, though these are large compared with the bulk of the bird,—the situations generally

* We must here except the CRIMSON-THROATED HUMMING-BIRD; Bullock found it on the mountains which enclose the valley of Tenochtitlan, and observes, that he never met with it but in *high, cold* situations; and that he several times *shot it on the ground*, on which the other species seldom, if ever, alight.—See “Six Months in Mexico,” vol. ii. p. 175.

chosen,—the paucity of human population in the regions or districts which most species affect—and the little attention paid to them, even when noticed, except by European collectors, tend greatly to their exemption from molestation. Perhaps more birds' nests are despoiled in one year in England, than are those of the collective group of Humming-birds in several seasons. Hence, their nests are much rarer in cabinets than might be expected from the number of species therein contained. Probably most species breed at least twice during the season, and on the average, in ninety-nine cases out of the hundred, in safety. Putting, then, these things together, the numerical abundance of the *Trochilidæ* in their respective localities, each species having its *dilecta sedes*, may, we think, be not unreasonably accounted for, as well as the perpetuation of this abundance in spite of losses by man, by casualties, and also by natural death.* With respect to the ordinary duration of the life of these birds, nothing has been ascertained; nor have we any data by which to form a conjecture; we only know that the young males do

* According to Mr. Hill, the Grey Petchary of Jamaica and other islands, a species of Tyrant Flycatcher (*Tyrannus Dominicensis*), is known not unfrequently to make the Humming-birds its prey, darting upon them as they hover over the blossoms of the garden. When this fierce bird has seized a victim he kills it by repeated blows, struck on the branch, where he devours it.

not acquire their full plumage till the second, or even perhaps in some species till the third year. We have, therefore, no reason to believe that they are very short-lived, according to the laws of nature.

On comparing the intelligence of the Humming-birds with that displayed among other groups of the feathered race, we do not find that they sink in the scale. The narratives of those who have had the best opportunities of observing them in their native climates lead us to the opposite conclusion. If we look at the skull of the Humming-bird, comparing it with the rest of the skeleton, we shall find it large, high, and boldly arched; it is voluminous, notwithstanding the size of the orbits of the eyes, and *cæteris paribus*, it is as superior to that of a fowl or duck as is the skull of Caucasian man over that of the ape. To the size of the skull in these birds Wilson alludes, in his history of the RUBY-THROAT; he also observes that the heart is nearly as large as the cranium, having its fibres very strong; and he adds that he found the brain "large in quantity, and very thin." What he precisely means by the expression, "very *thin*" (and yet *large* in quantity), we do not quite understand. Perhaps he alludes to the sudden tapering of the brain towards the olfactory nerves, whence it assumes a triangular appearance: such is the general character of the brain of birds; but this is immaterial.

Setting the above points aside, we may urge that the intelligence of these tiny beings is manifested in their inquisitiveness; if struck at as they dart along, or if assaulted by the sweep of a net, they will hover round the aggressor, peer closely into his face, or examine the instrument designed for their capture. In like manner they scrutinize the intruder who approaches near their nests. When taken prisoners and placed in a room, we have seen how confident and familiar they speedily become—how unrestrained are their actions—how soon they recognize their friendly gaoler, and learn to trust themselves to him, evincing pleasure on his appearance, and courting his notice. Could they be preserved, in suitable and ample aviaries, which might in their native country be managed without any great difficulty, we hesitate not to say that they would become more familiar with their keeper than the most petted canary—more playful and intrusive, and lose every trace of distrust or apprehension. It is true that on being first taken, many suffer an agony of terror, and probably by a sudden and violent revulsion of blood to the brain, quickly expire. But this very fact is an additional proof of their intelligence; a stupid animal would not understand the novel and startling predicament into which it found itself entrapped. But the bird at once becomes aware of its alarming position, and feels acutely; at

the same time, by gentle management, it may be reconciled and rendered happy, exchanging its terror for familiarity.

The *Trochilidæ* are divided by modern ornithologists into numerous genera, of which fifty-seven are enumerated by the Prince of Canino, in his "Conspectus Generum Avium." In most instances the generic characters are sufficiently determinate, but that some genera will have to be remodelled, is only what may be expected in a group so abundant in species; nor can it surprise us if others be added from time to time as our knowledge of these birds is increased by farther research.

We have already said, that as a general rule the females differ so much in colour and style of plumage from the males, that they might be (as indeed they have been) mistaken for different species. On the contrary, however, in some instances the sexes resemble each other so closely, that in order to denominate with certainty between them, dissection of the freshly-killed bird is necessary. In cases where the sexes differ in plumage it is not always very easy to distinguish between an adult female and a young male of the year. Sometimes, however, the young male exhibits traces of future splendour which, to the eye of the naturalist, are sufficient sexual indications, although an ordinary observer would overlook them.

So far have we endeavoured to convey a clear idea of the general economy of this *anthophilous* race of birds, a race respecting which very meagre information has been presented in a compact form to the general reader, or to the lover of nature. It is true that writers on this department of ornithology have been lavish in their expressions of admiration, and have indulged in phrases of eulogy, almost as glowing in language as are the birds themselves in colour. Nor do we blame them; for who can behold unmoved the glories of a cabinet of Humming-birds! but after language is exhausted in attempts to describe the effulgent splendour of these radiant "daystars," something yet remains—a plain, simple, readable account of their habits and manners, and in the preceding pages this has been our aim. As a knowledge of the multitudinous forms of these birds has only been acquired by slow degrees, and is not yet complete, so is it even more protractedly that a knowledge of their economy has been gleaned. Formerly, these birds were supposed to live only upon the nectar of flowers; we now know that they are essentially insectivorous. Formerly, they were regarded as especial denizens of a torrid region; we now know that some visit the wilds of Canada in the north, others Patagonia and adjacent islands in the south, and that others are tenants of mountain ranges, and flit and build around the limits of the expanse of perpetual snow. All

our preconceived ideas respecting these birds have been modified, as traveller after traveller has added to our information ; and yet we have much, and for years shall have much, to learn.

We have alluded to a very petrel-like species, to which our obliging friend, Mr. Gould, called our attention. Its short tarsi, its peculiar structure of wing, and its dull plumage, were, at a glance, apparent ; but that decided oleaginous odour which is exhaled from the skin of the Petrels and other allied oceanic birds, was what most surprised us ; it was perceptible as soon as the specimen was taken from the box, and had we not used the sense of vision, as well as that of smell, we should have said, this is a small Petrel or *Thalassidroma*. What know we of the habits of this bird, except that it frequents the borders of lakes and marshes ? It is not improbable that it may feed on minute Mollusks, semi-microscopic Crustaceans, and the larvæ of aquatic insects, as well as on those insects which tenant the nectary of the flowers which skirt the margin of the water.

Similar observations apply to other species contained in Mr. Gould's unrivalled cabinet. Many of them present us with singularities of form, indicative of a peculiarity in habits and economy which remains to be ascertained. Notwithstanding, however, that much has yet to be learned respecting this group of birds, much, within the last few years, has been acquired.

To the works of zoologists who have recently added to our knowledge we have made free reference, with feelings of gratitude. In justice to these writers, we have generally transcribed their own words (for, unless abbreviation be necessary, this we believe to be a bounden duty), and when we have merely given the substance of their observations and experimental proceedings, we have acknowledged the source whence our details were derived.

It is now time that we proceed to give the characteristics of such forms and species as are most worthy of the attention of the general reader; and, in so doing, we shall omit those already described by Sir W. Jardine, in his Natural History of Humming-birds, only making references to them, and giving the numbers of the page and figure. It is but proper to observe, that our descriptions are all taken from specimens in the cabinet of Mr. Gould, without access to which we could scarcely have ventured upon the present undertaking; inasmuch as, to ransack the museums of England and the Continent is a work of no trifling expenditure of time and pecuniary resources. But the noble cabinet alluded to has rendered this, thanks to its owner, needless.

DESCRIPTIONS.

Genus, GRYPHUS, Spix (*Rhamphodon*, Lesson).

In this genus the bill is long, strong, and rather broad; each mandible is finely serrated, with numerous minute closely set spinous teeth, for some distance, at the apex: these teeth are directed backwards; the point of the upper mandible is hooked, and overarches that of the lower. The wings are very strong and ample; the tail is graduated, and rounded at the apex; the feet are small.

Example.—*Trochilus nævius*, Dumont. *Rhamphodon maculatum*, Lesson. Locality: the mountain districts of Brazil. (Naturalist's Libr. Ornith. vol. i. p. 75.)

This is the only species known at present belonging to the genus *Gryphus*. From the strength of its wings, which have the shafts of the quill-feathers very stout and elastic, from the amplitude of the tail, the minuteness of the feet, and more particularly from the serration or denticulation of the beak, it may be presumed that this bird is well adapted, not only for securing insects of considerable strength lurking in the corolla of flowers, but also for predatory excursions on the wing; in other words, for the capture of insects during flight, which, when seized, would not easily extricate themselves from the

prehension of a beak so armed as is that of the present species. In Gould's cabinet.

Genus *GLAUCIS*, Boié.

Passing to the genus *Glaucis*, Boié, distinguished by the arched form of the beak, and of which the *Trochilus hirsutus*, or Hairy-legged Humming-bird, is an example (Naturalist's Libr. Ornith. vol. ii. p. 129), we may here describe the *Trochilus aquila*, or Eagle Humming-bird, as a typical form illustrative of the genus.

Example.—*Trochilus aquila*, Bourcier (from Loddige's MSS.) Adult male. The beak very much arched, describing the third of a circle; the mandibles robust, very dilated at the base, and pointed at the tip: the upper mandible black, rounded above, and channelled along each side; the lower mandible white, also channelled along the sides, and somewhat exceeding the upper in length. The head greyish-black; the neck, the scapulary feathers, those of the back, and the tail-coverts, of a glossy blue-green, the latter being slightly fringed with rufous. The throat and all the under surface of the body clothed with silky feathers, of a greyish-black, dashed with white: the under tail-coverts grey, white in their centre. The wings are almost straight, with powerful quill-feathers, of a greyish-black. The tail is rounded fan-like, and is composed of angular feathers, of a pale bluish-green, with the tips white; this white is most

extensive on the outer feathers, diminishing on each of them to the middle feathers, which have merely the apex marked with white. The feet are very strong, black, and naked. Locality: New Grenada, the neighbourhood of Bogota, whence Mr. Loddige's specimen was brought by Mr. Wallis. This bird differs so much in its characters from the other Trochilidæ, that there are few species to which it approximates, except, says M. Bourcier, to the *Trochilus Mazeppa* of Lesson. The Prince of Canino evidently regards the *Trochilus Mazeppa* as identical with *Trochilus hirsutus*, although he adds a query.—Proc. Zool. Soc. 1847.

In Loddige's and Gould's cabinets. [The *Trochilus hirsutus* is also in Mr. Gould's cabinet, and an allied species, *Tr. Condamini*, Bourcier.]

Genus PHAETORNIS.

In this genus, the beak is long and arched; the wings are moderate, the tail is greatly graduated, the feathers composing it being narrow and pointed, the two central exceeding the rest. The nest is deep, silky or cottony, with a long tapering point, its shape exteriorly resembling that of a funnel; it is suspended by spiders' webs at the extremity of a leaf. Of this genus, the *Trochilus superciliosus* is the typical form. Twenty-four or five species are known.

Example.—*Trochilus hispidus*, Gould.

In this species, all the upper surface is bronzy

brown; the ear-coverts are dark brown, bordered above and below with a line of buff; the under-surface is brownish grey, with broad stripes of white down the throat, where the feathers are much elongated; tail greenish-brown, the lateral feathers slightly tipped with white; the central feathers much elongated, and attenuated towards the apex, the attenuated portion being white. The wings are brown; the upper tail-coverts very broad, much prolonged, and hair-like; the bill is black, the basal half of the under mandible being of a straw-colour. Total length, $6\frac{1}{2}$ inches; bill, $1\frac{1}{2}$ inch; tail, 3 inches.

“This bird,” observes Mr. Gould, “belongs to the same section as the *Tr. Bourcieri*, the *Tr. Guy*, the *Tr. Eurynome*, and others of Lesson, and equals in size the largest of them.

Locality: Peru?—(Proceed. Zool. Soc. 1846). In Gould’s cabinet.

Of the habits of this bird, nothing has been ascertained. The genus is numerous in species, natives principally of Brazil and Guiana.

Among these we may note, the *Trochilus superciliosus*, described and figured as the Supercilious Humming-bird in the Naturalist’s Libr. Ornith. vol. ii. p. 119, pl. 27. Locality: Brazil and Guiana. In Gould’s cabinet.

Trochilus Eurynome, described and figured as the Scaly-backed Humming-bird in the Naturalist’s Library, vol. ii. p. 121, pl. 28. Locality: Brazil. In Gould’s cabinet.

Trochilus Guy, described as Guy's Humming-bird in the Naturalist's Library, vol. ii. p. 122. Locality: Brazil. In Gould's cabinet.

Trochilus intermedius, Lesson, described as the Intermediate Humming-bird in the Naturalist's Library, Ornith. vol. ii. p. 123. Locality: Brazil. In Gould's cabinet.

Trochilus Bourcieri, described as Bourcier's Humming-bird in the Naturalist's Library, vol. ii. p. 124. Locality: the mountains of Brazil. In Gould's cabinet.

Trochilus Longuemareus, described as Longuemare's Humming-bird in the Naturalist's Library, Ornith. vol. ii. p. 126. Locality: Guiana. In Gould's cabinet.

Trochilus squalidus, described as the Brown Brazilian Humming-bird in the Naturalist's Library, Ornith. vol. ii. p. 125. Locality: Brazil. In Gould's collection.

Trochilus Eremita, the Hermit Humming-bird, or Little Hermit.

The male in this species has the bill black, except the base of the lower mandible for about two-thirds, which is yellow; crown of the head, back of the neck, back and shoulders bronzy green the green predominating on the latter; a stripe over and behind the eye, together with all the under-surface buff, a few white feathers on the lower part of the abdomen excepted; ear-coverts and tuft of feathers on the chest black; rump and upper tail-coverts reddish buff; tail

bronzy-brown with green reflexions, each feather being tipped with buff, paler on the two centre ones; wings deep purplish-brown; outer side of tarsi clothed with short buffy-brown feathers; feet and inner part of tarsi yellow.

Total length, $3\frac{1}{2}$ inches; bill, $1\frac{1}{6}$; tail, $1\frac{3}{8}$.

The female resembles the male in colour, but is smaller in size. In Gould's collection.

The nest is attached, by means of spiders' webs, to the extremity of a leaf; it is composed of fine silky and cottony fibres, mixed with spiders' web and portions of a fungus resembling wool. In form it is deep, round and cup-shaped, and tapers to a lengthened point at the bottom.

Locality: Southern Brazil, Amazon.

This species is perfectly distinct from the *Trochilus Pygmæus* of Spix, from the northern parts of Brazil, and from the *Trochilus rufigaster* of Vieillot, said to be from Cayenne. Lesson's description of the latter agrees with the present species, but the figure which accompanies it, agrees neither with this nor any known species.

The *Trochilus rufigaster* of Vieillot is described in the Naturalist's Library, Ornith. vol. i. p. 83. pl. 4. under the title of the Rufous-bellied Humming-bird. In the same work, vol. ii. p. 127, a *Trochilus rufigaster*, Lesson, is described as the Red-bellied Humming-bird. To both these birds is applied as a synonym the term Colibri à ventre roussâtre of Temminck, pl. col. tab. 120.

Trochilus Petrii, Bourc. Locality: Brazil, Minas Geraes. In Gould's cabinet.

Trochilus anthophilus, Bourc. Locality: Columbia. Gould's cabinet.

Trochilus Swainsoni, described and figured as Swainson's Humming-bird in the Naturalist's Library, Ornith. vol. ii. p. 132, pl. 30. Locality: Brazil.

Lesson has described two distinct species of Humming-bird under the title of *Trochilus Swainsoni*, of which one appears to belong to the present genus; the other to the genus *Cynanthus*.

The *Phaetornis Swainsoni*, is abnormal in its form, and will probably be hereafter removed to another genus.

The Prince of Canino places it in this group, with a mark of interrogation.

The other *Trochilus Swainsoni* is described in the Naturalist's Library, vol. ii. p. 88.

Trochilus Davidianus, described in the Naturalist's Library, Ornith. vol. ii. p. 127.

This species is closely allied to the preceding.

The birds of this genus are very beautiful, and are swift and active on the wing. Many of the species are of minute size: some, indeed, as the *Tr. Longuemareus*, *rufigaster*, and *Davidianus*, scarcely exceed three inches in total length. The *Trochilus superciliosus* is the largest.

We now pass to the next genus in the arrangement of the Prince of Canino.

Genus LAFRESNAYA, Bonaparte.

The typical example of this genus is the

Trochilus Lafresnayi, Bois. 1848. *Trochilus flavicaudatus*, Fraser, in Proceed. Zool. Soc. 1840.

Beak twice the length of the head, and curved; tail moderate; the top of the head dusky brown; upper parts of the body golden green, under parts ochreous yellow; the throat plumes adorned with golden and coppery spots; the sides of the chest with golden-green markings; rump pale ochreous yellow; two middle tail-coverts golden green, the rest ochreous, tinged with green at the tips; the quill-feathers dusky, with a purple gloss; bill black; feet on the upper surface dusky black, but pale underneath.

Total length, $4\frac{1}{2}$ inches; bill, $\frac{1}{2}$; tail, 2.

Locality: Quito? In Gould's cabinet.

There is another species, *Tr. Gayi* (synonyme, *Tr. Saulæ*), Bourcier, from Quito, to which the *Tr. Lafresnayi* is very closely allied.

The genus *Doryfera*, Gould, next claims our peculiar notice.

GENUS DORYFERA. In this genus the bill is long and straight for three-fourths of its length, then inclines upwards to the extremity; the wings are moderately large; the tail is rounded, rather rigid, each feather ending in a point; the tarsi are partly clothed; the feet are moderate in size.

Examples: *Trochilas Ludoviciæ* (the Louise) and *Trochilus Johannæ*, Bourcier, in Proc. Zool. Soc. 1847 (*Tr. violifrons*, Gould, in Proc. Zool. Soc. 1847.).

In the latter species the forehead is ornamented with a round spot of beautiful metallic violet; the back of the head, the neck, and upper part of the back are bronzy-green, passing into purer green on the back and shoulders. The lower part of the back and upper tail-coverts are dull greyish-blue; the throat and abdomen black, with green reflexions; under tail-coverts deep violet blue; wings purplish brown; tail black, slightly glossed with green; bill black; feet brown.

Total length, $4\frac{1}{8}$; bill, $1\frac{1}{4}$; tail, $1\frac{3}{8}$ inch.

Locality: Peru. In Gould's cabinet.

This beautiful bird is precisely of the same form in every respect as the *Louise*, but differs most remarkably in the colour of its plumage, the forehead being violet instead of green, and the under surface black instead of golden-green.

We now pass to a genus containing species remarkable for beauty.

GENUS PETASOPHORA, G. R. Gray (*Heliothrix*, Boié: *Rhamphodon*, Lesson; *Colibri*, Spix, and, in part, the Prince of Canino).

The beak in this genus is long and slender, pointed, straight or very slightly arched, and in one species at least is very finely serrated upon the margins of the mandibles (*Tr. petasophorus*). The ear-coverts consist of large scale-like feathers, standing out from the sides of the neck, glittering with metallic violet-blue. The prevailing general tint is green. The tail is square,

or nearly so, and banded with dusky near the tip. Wings ample.

This is one of the best defined groups, observes Mr. Gould, of the family, and is distinguished by several peculiarities, the principal of which are the greatly developed ear-coverts, and their blue colour, and the similarity in the colour of the sexes; the females possessing all the brilliancy of the males, and only distinguishable from them by their smaller size, and more delicate contour: the young also assume the plumage of the adult.

The oldest known species constitutes the type; it is the

Sp. 1. PETASOPHORA SERRIROSTRIS, Vieill.
Nouv. Dict. tom. vii. p. 359; Encyclop.
Méth. part 2, p. 561; Ois. Dor. tom. iii.
pl. 1.

Ornismya petasophora, Less. Ois.
Mouches, pl. I. Ib. Troc. pls. 12 and 59.
Pr. Max. de Wied, sp. 10. Temm. pl.
col. 203, fig. 3.

Trochilus petasophorus, Nat. Lib. Ornith.
vol. i. p. 120, pl. 13, male; vol. ii. p. 81,
pl. 15, fem.

Petasophora serryrostris, G. R. Gray,
List of Gen. of Birds, 2d edit. p. 17.

Hab.—Brazil.

Sp. 2. PETASOPHORA CYANOTUS, *Trochilus*
cyanotus, Bourc. Rev. Zool. 1843, pl. 1.
Ann. de Lyons, tom. vi. p. 41; but not

the cyanotus stated by Lesson to be synonymous with *Delphinæ*.

This species appears to be the representative of the *P. serrirostris* of the Brazils, from which it is at once distinguished by the blue covering of the ear-coverts.

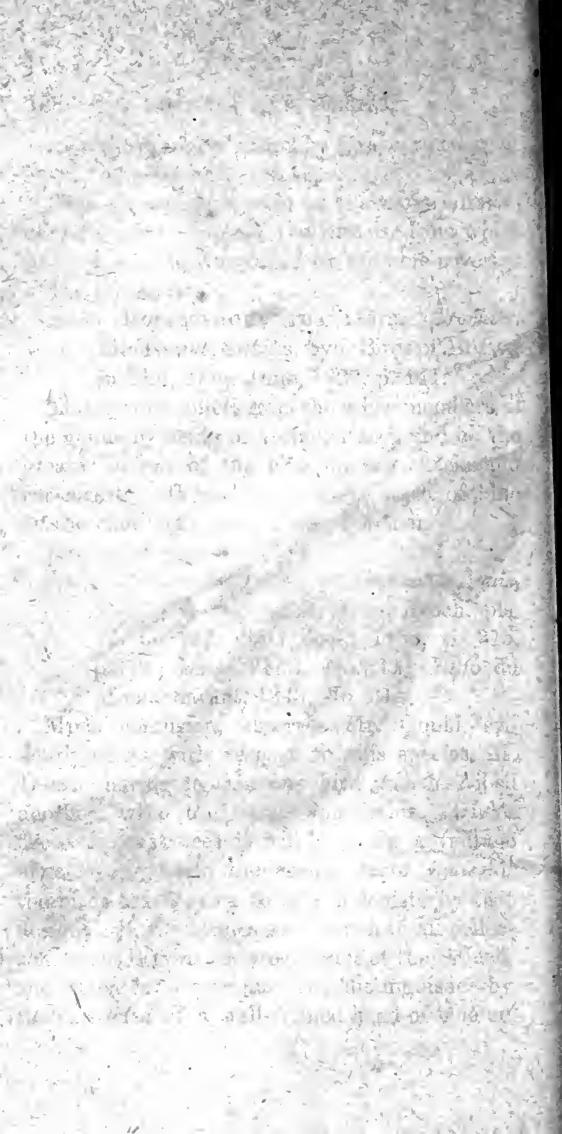
Sp. 3. PETASOPHORA THALASSINA, *Trochilus thalassinus*, Swains. Syn. Birds of Mexico, in Phil. Mag. June, 1827, p. 441.

This species differs from the other members of the genus by being of a smaller size, and by the greater extent of the blue on the cheeks and ear-coverts. It has also a slight wash of blue on the chin and centre of the abdomen.

Hab.—Mexico.

Sp. 4. PETASOPHORA ANAIS, *Ornismya Anais*, Less. Col. Sup. pl. 3; Less. Troch. pls. 55, 56, 57; Rev. Zool., 1838, p. 315, p. 19; Less. Velin, No. 11; Echo du Monde Savant, 1843, No. 31.

Much confusion, observes Mr. Gould, evidently exists with respect to this species, M. Lesson having figured one bird and described another, with the same appellation. Under these circumstances it will be to the advantage of science to retain the specific term *Anais* for the birds best known to ornithologists by that designation, the species so common in all collections from Bogota, the *great Anais* of the French, and which is a very fine bird, distinguished by the existence of a well-defined band of blue on







the throat. The female is fully as bright as the male, but at least one-third smaller in size.

Hab.—Venezuela, and all the Cordilleras in the neighbourhood of Bogota.

Both *P. Anais* and *thalassina* are nearly allied to the next species, but are inferior in splendour of plumage and size.

Sp. 5. *PETASOPHORA IOLATA*, Gould, in Proc. Zool. Soc. 1847. (Plate I.)

This is a very gorgeous species, glittering with metallic effulgence. Head and all the upper surface deep green, often washed with gold; primaries and secondaries, brown tinged with purple; chin, space beneath the eye, ear-coverts, and also the centre of the abdomen, rich, deep metallic blue, the under surface generally rich, deep glossy green. The throat presents a tessellated appearance, occasioned by the reflexion from the webs of the feathers which throws a darker hue on the centre of each. Under tail-coverts, pale green, with lighter margins; two centre tail-feathers golden green, the rest of a steel or bluish shining green, crossed near the extremity by a broad band, which is dull black on the upper surface, and shining steel-blue on the under. Bill and feet black.

In this magnificent species the ear-tufts are very ample, and the abdomen of an intense metallic violet-blue. The chest is dazzling.

Total length, $5\frac{3}{4}$ inches; bill, $1\frac{3}{8}$; tail, $2\frac{1}{2}$.

The female is similar to the male in plumage, but is smaller in size.

Hab.—Bolivia. In Gould's cabinet.

Sp. 6. PETASOPHORA CORRUSCANS. — Gould in Proc. Zool. Soc. 1846.

This is a very beautiful species, rather less in size than *P. Anais*, from which, and every other species, it is distinguished by the lovely marking of the throat, the greater extent of blue on the abdomen, and by the great breadth of the feathers of the tail.

Crown of the head and all the upper surface green; tail-feathers very broad, of a steel-blue, with green reflexions, and, as in *Anais* and *serrirostris*, crossed with a broad band of a blackish hue. A band of rich pure blue commences on the chin, whence it extends along the sides of the cheeks, and on the ear-coverts, which, when erected, form conspicuous tufts. The scale-like feathers of the centre of the throat form a gorget of rich shining green, with bronze and dark crimson reflexions. The centre of the abdomen blue. Under tail-coverts dull green, broadly tipped with buff. Wings purplish-brown; bill black; feet brown.

Total length, $5\frac{1}{4}$ inches; bill, $1\frac{1}{6}$; tail, 2.

Hab. not yet determinately ascertained. In Gould's cabinet.

Sp. 7. PETASOPHORA DELPHINÆ. O. Delphinæ, Less. Rev. Zool. 1839, p. 44. Echo du Monde Savant, 1843, No. 13. Less. Ill. de Zool. tom. ii. 1832, pl. 64.

Sp. 8. PETASOPHORA? GEOFFROYI, *Trochilus*

Geoffroyi. Bourc. et Muls. Ann. de Lyons, tom. vii. p. 37.

This species will most probably be hereafter regarded as the type of a new genus, its present position being merely provisional.

We must here observe, that the Prince of Canino separates the species *cyanotis*, *thalassinus*, *Anais*, *iolata*, *corruscans*, *Delphinæ*, and *Geoffroyi* from the genus *Petasophora*, and places them in a genus which he terms *Colibri*. But we agree with Mr. Gould in his opinion, that the type of the genus *Colibri* is the Ruby-throat of North America, the *Trochilus colubris* of Linæus, and that the term should not be applied to the foregoing species, even granting the necessity of their removal from the genus *Petasophora*. We very much question the propriety of splitting up genera *ad infinitum* on trifling data as variable as they are non-arrestive to the eye, except it be hypercritically microscopic. Let this system be carried out, and the genera will become almost as multitudinous as are the species. We have yet to search for a rule on which alone a genus ought to be substantially founded. But, in the *making* of genera, every one seems to follow his own caprice.

We now pass to the genus *Heliothrix*.

Genus HELIOTHRIX, Boié. (*Les Jacobines*, Less. *Colibri*, in part, Spix.)

The species of this genus are pre-eminently

adapted for flight; the wings are long and ample, the feet very small, the bill slightly arched and wedge-shaped; the plumage delicate and lovely. No doubt they are active fly-catchers on the wing.

The type of this genus is *Trochilus auritus*, Gmelin, and has been described by Vieillot, Shaw, Lesson, Swainson, and others, but rather vaguely.

Two other good species are, as well as the preceding, in Mr. Gould's collection, viz. *Tr. Poucheti*, Less. (*Tr. auriculatus* Licht.) and *Tr. Barroti*, Bourc. Rev. Zool. 1843.

The *Ornismya nigrotis* of Lesson appears to be identical with the *Trochilus auritus*.

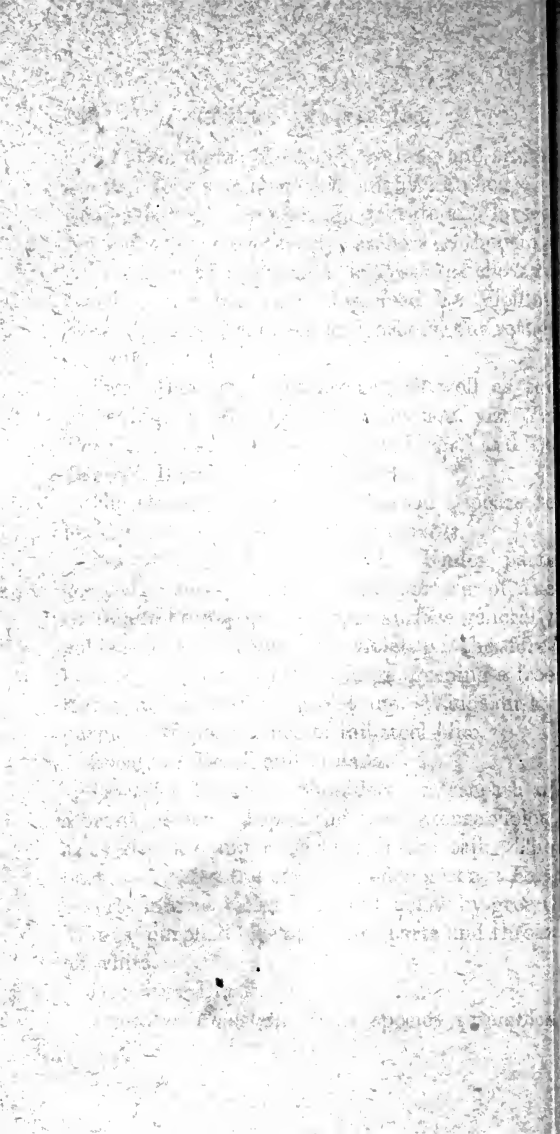
Trochilus auritus, Plate II. Under parts generally snowy-white, under surface of the shoulders bronzy-green, upper surface generally golden-green, inclining to violet on the forehead. Auricular feathers large, forming a free tuft of a deep lustrous violet hue. Wings dusky purple. Upper surface of tail steel-blue.

Locality: Brazil and Guiana.

Trochilus Barroti. Shoulders underneath of a bronzy-green. Top of the head intense violet, as is also the upper surface of the tail. The back and upper tail-coverts golden-green. Ear-coverts intense violet bordered below by green. Wings purplish-black; under parts and throat all white.

Locality: Brazil.

Trochilus Poucheti. This species resembles







Tr. Barroti, with this exception, that the throat is golden-green.

We here pass to the genus **DELATTRIA** of Bonaparte.

DELATTRIA, Bonap.

In this genus the beak is nearly straight, or quite so; the tail is ample and nearly square; the wings powerful and falciform; the gorget extensive and lustrous. This genus contains four species, of which we have only examined one.

Trochilus fulgens of Swainson, (*Ornismya Rivoli*, Less.) described in the Naturalist's Library, Ornithology, as the Duke of Rivoli's Hummingbird, vol. ii. p. 96, c. figurâ, pl. 18. It is a native of Mexico. In Gould's cabinet.

Genus **HELIODOXA**, Gould in Proc. Zool. Soc. 1849.

(*Leadeatera*, Bonap.)

In this genus, remarkable for the splendour of its species, the bill is straight, or slightly curved downwards, and of moderate length. The nostrils are covered by an operculum. The wings are pointed, rigid, of moderate size, and well adapted for sustaining flight. The tail is of moderate size, and considerably forked. The feet are moderate, with the outer toe shorter than the inner. The tarsi are clothed with fine feathers.

The type of this genus (some of the species of which are thrown by the Prince of Canino

into the genus *Heliomaster*) is the *Heliodoxa Jacula* of Gould. In the male, the crown of the head, the breast, and abdomen are of a resplendent metallic-green; in the centre of the throat a crescentic mark of metallic-blue; back of the neck, back, and upper wing-coverts bronzy-green; under wing-coverts and flanks grass-green; wings purplish-brown; upper tail-coverts purplish-brown, with green reflexions; under tail-coverts dark-brown, also with green reflexions. Tail considerably forked, and of a bluish black; thighs and tarsi white; feet blackish-brown; bill black.

Total length $5\frac{1}{4}$ inches; bill, $1\frac{1}{8}$; tail, $2\frac{3}{8}$.

In the female, the crown of the head and the upper surface are green; the throat is shining metallic-green, the white bases of the feathers shewing through, and giving the throat a speckled appearance; the tail is bluish-black tipped with white. In some specimens the lores are buff, and a line of the same hue extends beneath the eye; thighs white; under tail-coverts dull-green; bill black.

Locality: Santa Fe de Bogota. In Gould's cabinet.

It is probable that the *Trochilus rubineus* of Latham (Nat. Libr. Ornith. vol. ii. p. 65, erroneously called the Ruby-throated Hummingbird), and the *Tr. rubinoides* of Bourcier (Ann. Sc. Lyons, 1846), will be added to this genus;—the Prince of Canino arranges them under his genus *Heliomaster*.

Genus HELIOMASTER. In this genus the beak is long and straight or only very slightly arched; the feet are small, and the tail ample. The gorget, or throat-plume, is extensive, and produced more or less laterally by means of large pointed feathers. The females are far plainer than the males.

The types of this genus are, the *Trochilus longirostris* of Vieillot (*Trochilus superbus*, Shaw, *nec* Vieill.), described as the Superb Humming-bird in Nat. Lib. Ornith. vol. ii. p. 94); and the *Tr. mesoleucus* of Temminck (*Tr. longirostris*, Natter. *nec* Vieill.), described and figured in Nat. Lib. Ornith. vol. ii. p. 91, pl. 17, as the White-striped Humming-bird.

The birds of this genus are remarkable for powers of flight. The first species enumerated is a native of the Antilles (Island of Trinité), the second of Brazil. In Gould's cabinet.

Mr. Gould separates from the foregoing genus a species to which he gives the generic title of PTEROPHANES. This species is the *Trochilus Temminckii*, Boiss. *nec* Less. (*Tr. cyanopterus*, Loddig.) It is a native of the mountain range of Columbia, and is described and figured by Mr. Gould, in his *Monogr. Trochil.* (fig. 7), under the title of "Temminck's Sapphire-wing" (*Pterophanes Temmincki*, Gould).

This species ranks amongst the most gorgeous of the *Trochilidæ*, and is, in particular, to be distinguished by the brilliant colour of its wings.

The adult male has all the upper surface and the lesser wing coverts deep grass-green, becoming lighter on the rump; a small spot of white immediately behind the eye; under surface dark luminous grass-green; tail glossy olive-green; wings both on the upper and under surface, shining deep blue; all the feathers margined, and the primaries largely tipped, with dull brownish-black; bill black; feet brownish yellow.

Length $6\frac{1}{2}$ inches; bill, $2\frac{1}{2}$; tail, 3.

The female, with the exception of the throat, which is brown, has the body similar in colour to that of the male, but less brilliant; tail glossy olive-green, except the outer feather on each side, which is brown, with an indistinct lighter mark down the outer web; wings purplish brown; under part of the shoulder blue. The young of both sexes have the crown of the head brown, and the throat, chest, and centre of the abdomen deep reddish buff.

Locality: Santa Fé de Bogota; Pasto.

This species frequents the *Tacsonia mollissima*, a beautiful plant indigenous to the tropics of New Granada, and growing at the height of nine or ten thousand feet above the level of the sea.

Genus *CAMPYLOPTERUS*, Swainson.

In this genus, the beak is strong and arched at the apex. The wings are narrow, rigid, and

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head + brownish + orange, with black + feet brown
 black + feet brown

The female is the same as of the male.

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Donas CAR. PRODUCA. SYMBLON.

In the court, the judge is sitting and he is not there. He is not there, right?





scythe-like—the first three or four quill-feathers having, in the males, the shafts singularly dilated. The tail is ample, with the outer feathers largely tipped with white, or greyish white. The feet are small. As a rule, the gorget is iridescent steel blue; the back green. The females are plain and dull. Bill arched at the apex.

As a type of this genus, we refer to the Blue-throated Sabre-wing, or *Campylopterus latipennis* of Swainson, described and figured in the Nat. Lib. Ornith. vol. i. p. 146. It is a native of Tobago. Nine species besides are known, of which one is undescribed. From these we select *Campylopterus obscurus*, Gould, in Proc. Zool. Soc. 1848, by way of example.

In this species the crown of the head, all the upper surface, and the four middle tail-feathers are green; the throat and under surface dark grey; the flanks and under tail-coverts washed with green; the three lateral tail-feathers on each side are black, the two outer ones being tipped with grey. Length $5\frac{1}{4}$ inches; bill, $1\frac{1}{8}$; tail, 2.

Locality: the borders of the Amazon, Brazil. In Gould's cabinet.

Another fine species is the *Campylopterus lazulus*, Vieillot. In this bird the head and upper parts are green; the throat and chest lazuline blue, passing into green on the sides. Tail chestnut, tipped with black; the shafts of

the first four quill feathers, especially the first and second, remarkably dilated. Female dusky below, with a tinge of green on the throat. In Gould's cabinet. *Rare*.

Locality: Jamaica?

Campylopterus Pampa, Less. Crown, in a line above the eye, azure blue; upper part of the body green; under parts pale grey; tail, wedge-shaped, green; the outer tail-feathers dark at the tips.

Locality: Paraguay.

In the genus *Campylopterus*, the powers of flight are extraordinarily developed,—but the flight is not like that of a butterfly or a bee,—the wings do not perform a succession of such rapid vibrations, as to render them scarcely visible, but winnow the air with more measured, yet vigorous strokes, as we see in the case of the Swift; thus they dash along the surface of rivers or marshes, or wheel around the trees, the blossoms of which attract them. Evening is their favourite hour of disport.

Genus LAMPORNIS.

In this genus the beak is gently arched and long; the wings are rigid and adapted for powerful flight; the tail is ample, and the tarsi small. Of this genus the *Trochilus Mango*, (Mango Humming-Bird) is an example. See Naturalist's Lib. Ornith. vol. ii. p. 100, pl. 20. "For what reason Linnæus applied the trivial

name of Mango to this species (says Mr. Gosse) I have no knowledge: that it could have no connexion with the mango-tree is evident, since that tree was not introduced into the western world till long after his time. It is perhaps a native name. This species is not confined to Jamaica, but seems more widely spread than most of these tiny birds." Lesson says, "The Mango inhabits Jamaica, and, as it appears, not only the greater Antilles but also Terra Firma, and, as it is said, Brazil and Guiana." Hence it has long been familiar to naturalists. "It is the largest or blackest Humming-bird of Sloane. Lesson in his *Les Colibris*, has given no less than four figures of this species in different ages, pl. xiii. to xv.; but I cannot say much in their praise."

"The *Polytmus Mexicanus*, and *Polytmus Jamaicensis* of Brisson refer without doubt to the present bird. It is *Le plastron noir* of Buffon. Whether *Trochilus gramineus* of St. Domingo, which has been supposed to represent this species in that sister-island is really anything more than a mere variety I have no means of determining. My valued friend, Mr. Hill, in writing to me observes: Buffon makes his *Plastron noir* of Jamaica common to Brazil and St. Domingo. The compensatory bird in St. Domingo is much more green than Jamaica specimens, that is, with less disposition to assume the violet and purple in the changes of light, and with decid-

edly a less prevalence of what Buffon designates the *beau noir velout*

“I may add, that both the birds alluded to have been familiar to my friend from personal observation in both islands.”

The appellation by which the Mango Humming-bird is familiarly known to the negroes in the colony is that of *Doctor-bird*, which is sometimes applied also to *Polytmus*, and to some others also. The origin of this term is thus explained by Mr. Hill: In the old time when costume was more observed than now, the black livery of this bird distinguishing it from the gayer and more brilliant *Trochilidæ* led to its professional title. It might with propriety have been called the Parson; but parsons were less known than doctors in the old times of the colony.

The *Trochilus gramineus* of St. Domingo (and also Guiana) is decidedly distinct from the Mango, though closely allied to it. It is *Trochilus gramineus* and *maculatus*, Gmelin,—*pectoralis* and *gularis*, Latham—*Polytmus Dominicus*, Brisson. It is described and figured in the Naturalist's Lib. Ornith. vol. i. p. 143, pl. 32, male, pl. 33, young. In the Proceeds. Zool. Soc. 1846, Mr. Gould describes two species of this genus (*Lampornis*): the first under the title of *Trochilus* (*Lampornis*) *cyanopectus*, which has the throat of a lustrous metallic green; the centre of the breast is deep luminous metallic blue; the head,

back, shoulders, flanks and lower part of the abdomen, bronzy green. The wings are purplish brown. In some specimens the tail is entirely bronzy brown; in others, bronzy brown with a spot of white on the inner web at the tip of each feather. The bill is black, curved, stout and large for the size of the body.

Total length, $4\frac{3}{4}$ inches; bill, $1\frac{3}{8}$; tail, $1\frac{3}{4}$.

Habitat.—Venezuela. In Gould's cabinet.

The second is *Trochilus (Lampornis) aurescens*. Description as follows:—Throat, rich luminous gold colour; across the chest a band of deep rufous; on the forehead a narrow stripe of shining bluish green. All the upper surface, two central tail feathers, upper and under wing-coverts, and abdomen, bronzy green; wings purplish brown; lateral tail feathers chestnut brown, tipped both above and beneath with a bronzy lustre; under tail-coverts deep fawn colour; bill black.

Length, 4 inches; bill, 1; tail, $1\frac{1}{2}$.

Hab.—Rio Negro, Brazil. In Gould's cabinet.

A third species, *Trochilus fulviventris*, is also described by Mr. Gould, with a query as to its place in the present genus, to which it does not belong:—Head, all the upper surface and tail glossy green; the outer feathers of the latter tipped with white; wings brown; throat, breast and abdomen deep buff; under tail-coverts white; upper mandible and points of the lower black; the rest of the under mandible buff.

Total length, 4 inches ; bill, 1 ; tail, $1\frac{1}{2}$. Locality : Venezuela. In Gould's cabinet.

The Prince of Canino refers two closely allied species, viz. *Trochilus Buffoni*, Less. see Nat. Lib. Ornith. vol. ii. p. 98, pl. 19, and the *Trochilus cæruleogaster*, Gould, to this genus,—with this expression, "*Valdè abnormes, vix hujus generis*," thereby intimating a provisional allocation only. He farther observes, that the *Tr. cyanopectus*, Gould, and the *Tr. aurescens*, Gould, are both aberrant forms, and he is quite correct in this opinion, which is that also of Mr. Gould.

In the Proceeds. Zool. Soc. 1847, Mr. Gould thus describes the *Tr. cæruleogaster*.

Trochilus (Glaucis?) cæruleogaster. Crown of the head and back of the neck, dull bronzy green ; back green, passing into a bronzy green on the rump and upper tail-coverts ; chin and sides of the neck green, gradually passing into the beautiful blue of the throat and abdomen ; under tail-coverts largely developed and of a pure white ; tail black, with steel blue reflections ; wings purplish brown ; bill black ; feet brown. Total length, $4\frac{3}{4}$ inches ; bill, $1\frac{1}{8}$; tail, 2.

This species is similar in every respect to *Tr. Buffoni*, excepting that the throat and abdomen are of a beautiful blue, instead of being green. The *Tr. Buffoni* is a native of Brazil, but the locality of the present species is not determined. In Gould's cabinet.

Genus EULAMPIS, Boié.

This genus is represented by the *Trochilus holosericeus* of Linnæus (*T. atrigaster*, Shaw), described in the Naturalist's Lib. Ornith. vol. ii. p. 103. This species, according to Lesson, is confined to the Antilles. In Gould's cabinet.

Genus POLYTMUS, Bonap.

This genus, as it stands in Bonaparte's *Conspectus Avium*, contains only one accredited species, the *Trochilus Polytmus* of Jamaica, a lovely bird, of which we have recorded many interesting details. It is described as the black-capped Humming-bird in the Naturalist's Library, vol. ii. p. 108, pl. 21. In one or two points the description is erroneous; the beak is not straw-yellow, but crimson, or coral red, in the male, and the mistake has arisen from the description having been taken from preserved skins, in which the natural colour of the beak had faded. Mr. Gould considers this bird as the type of the restricted genus *Trochilus*: see his Monogr. Trochil. part i. tab. 1. It is the *T. Polytmus* of Linnæus, the *Ornismya cephalatra* of Lesson

The following description from living specimens will not be unacceptable; with this preliminary remark, that it is not the outermost tail feather on each side which is elongated so remarkably, but the next in succession, and that

these feathers cross each other, the bird being in a state of repose. The female wants these caudal streamers. The beak is moderate, and nearly straight.

Male. Total length, $10\frac{1}{4}$ inches; bill, $\frac{3}{4}$; longest tail feather, $7\frac{1}{2}$; outermost tail feather, $1\frac{3}{4}$.

Irides black; beak coral red, the tip black; feet purplish brown, soles paler; back, rump and tail-coverts rich golden green; wings purplish black, the outer edge of the first primary whitish; second primary longest; tail deep black with a bluish gloss. The tail is slightly forked, the feathers regularly graduating from the central ones, outwards, save that the outermost but one is exceedingly lengthened. Throat, breast and abdomen gorgeous emerald green. Under tail-coverts purplish black; crown, back of the head, and nape deep velvety black, very slightly glossed; the plumage of the hinder part of the head long and loose, descending in two lateral tufts upon the nape, which are to some extent erectile.

Female, $4\frac{1}{8}$ inches in total length; tail, $1\frac{6}{10}$. Irides dark brown; beak dull reddish brown, black at the edges and tip; feet nearly black; forehead and crown dusky brown, scaled, gradually becoming green on the hind head, whence the whole upper plumage is rich golden green; tail blue-black, the exterior two feathers on each side broadly tipped with white; uropygials golden green; the feathers graduate uniformly;



TOPAZA PYRA



wings as in the male ; under parts white, the feathers having round tips of metallic green on the sides of the neck, and being mingled with green ones on the sides of the body ; the plumage on each side of the nape erectile as in the male, but somewhat shorter. In Gould's cabinet.

Genus *TOPAZA*, Gray.

This genus contains only two known species, the most gorgeously refulgent of their race, all minor beauties fading in their presence.

The bill is long, strong and arched ; the wings are long and ample ; the gorget is magnificent beyond description, and set off by a surrounding margin of velvet black ; the fourth tail feather on each side is greatly elongated, and these like streamers cross each other ; the general plumage is auriferous, but the thighs are snowy white.

The female is plain, and has no long tail streamers.

As an example of this genus we may refer to the Topaz-throated Humming-bird (*Trochilus Pella*), described in the Naturalist's Lib. Ornith. vol. ii. p. 115, pl. 24. But this species, magnificent as it is, "pales its ineffectual fire" before its ally, the *Trochilus Pyra*. "*Inter Trochilides pulcherrimus*," exclaims the Prince of Canino, and we agree with him.

Topaza Pyra. Plate III.

In our note, taken from Mr. Gould's specimens, we put down the following data. Most gorgeous! the female is also beautiful, though far inferior to the male. The nest is composed of a brown, close, sponge-like felt, and placed on a forked twig. The head and chest are velvet black; the gorget is scale-like, golden in the centre, passing at the sides into dazzling green; chest and abdomen, back and shoulders intense fiery bronze; under tail-coverts green; wings broad and ample; thighs white.

From this note, we proceed to a fuller description. Abdomen, sides, back and shoulders, luminous fiery red; head, ear-coverts, back of the neck, and a band crossing the lower part of the neck, deep velvety black; throat luminous pale green, passing into rich orange (effulgent gold) in the centre; two central tail feathers, purplish green, the remainder deep purple, the feathers on each side the central ones much elongated, and crossing each other near the base; upper tail-coverts luminous light green, with red reflexions; under tail-coverts luminous green; primaries purplish brown; bill black; feet blackish brown.

Length from the tip of the bill to the end of the central tail feathers, 6 inches; to the end of the elongated feathers, $8\frac{3}{4}$; bill, $1\frac{1}{8}$; tail, $2\frac{3}{8}$; elongated feathers, $4\frac{5}{8}$.

"I consider (says Mr. Gould) this to be without exception the most gorgeous species of

the Trochilidæ yet discovered. It is somewhat larger than *Tr. Pella*, but of precisely the same form. It far exceeds this fine species in the brilliancy of its colouring, and is at once distinguished from it by the fiery lustre of its body, and the purplish colouring of its tail feathers."

Habitat.—Rio Negro, Brazil. Both species in Gould's cabinet.

These birds are very powerful on the wing, and are said to frequent streams, rivers, and water-courses, over which they dash along in pursuit of insects, and doubtless the elongated tail-feathers have a decided influence as respects the address and suddenness of their aerial turnings and evolutions. The *Tr. pyra*, darting along in full sunshine on the wing must appear like a dazzling meteor, rapid and abrupt in its tortuous course.

With respect to the peculiar habits of these two resplendent birds, little is known, except, according to the information we have received, that *Tr. Pella* is a lover of solitude, shrouding its beauty in the gloomy recesses of forests. Its seasons of activity are the dawn of morning and the approach of evening twilight. During these hours it is actively engaged in quest of food,—darting through the glades, and along the borders of streams with wonderful velocity. At the same time we suspect, that, secluded in the umbrageous forest from observation, it is busily employed even during the hours of sunshine, only that it

does not then emerge from its covert so as to attract notice. It is not because the bird retires into its congenial forest gloom, that it necessarily seeks repose; indeed such could not be the case, while the young are calling incessantly on the parents for supplies of food. With all birds the rearing time is one of constant activity.

Genus CÆLIGENA. In this genus the bill is long and straight, the feet small, the wings long and powerful, the tail ample, and slightly forked; the upper tail-coverts are in the form of large scales. The general plumage is of a purple tint, with changeable reflexions of violet and brilliant red. The typical example of this genus is a rare species from Mexico, described as *Trochilus cæligena*, the Purple Humming-bird, in the Naturalist's Library, Ornith. vol. ii. p. 53, pl. iv. It is the *Cæligena typica* of the Prince of Canino, — *Ornismya cæligena* of Lesson. In Gould's cabinet.

A second species of this genus, and as yet undescribed, has been received by Mr. Gould from Bolivia.

From the development of the wings and tail in the birds of this genus, their powers of wing must be extraordinary, and their style of flight not unlike that of the Swift, which bird they considerably resemble in their general contour. Although the gorget is not dazzlingly effulgent,

as it is in many species of Humming-birds, the colouring of the plumage is very attractive. In size they rank amongst the largest of this group—the Purple Humming-bird measuring more than five inches in length, including the long beak. As to any peculiarities of habits, or mode of nidification, no positive information has hitherto reached us—a circumstance in the case of rare species not to be wondered at. It is to be hoped that, for the future, collectors of specimens will, if only to enhance the value of their “winged gems,” transmit with them some degree of information, which a little trouble might, in most instances, enable them to acquire. A collector should have a note-book in his pocket, as well as a gun in his hand.

Genus *LEUCIPPUS*, Bonap. The characters of this genus do not appear to be very definite. Two species are recognized; one *Trochilus (Leucippus) fallax*, which Mr. Gould regarded as belonging to the genus *Lampornis*. It is a native of Venezuela, and is described by Bourcier, in Rev. Zool. 1843.

The other is the *Trochilus Turneri* of Bourcier, *Trochilus hypoleucus* of Gould, in Proc. Zool. Soc. 1846. It is not remarkable for brilliancy. The description is briefly as follows:—All the upper surface is green; the throat and all the under surface white; wings brown; two central tail-feathers green, the remainder brown, glossed.

with green, and largely tipped with white; bill black; base of the lower mandible paler.

Total length, $3\frac{5}{8}$ inches; bill, $1\frac{1}{8}$; tail, $1\frac{3}{8}$.

Genus *BOURCIERIA*, Bonap. In this genus the bill is long and straight; the head crested with metallic feathers; the forehead blue or black; general plumage dusky; the chest abruptly white either across or at the sides; middle tail-feathers black, the rest white, except at the tip; tail ample; wings long; foot small; thighs white.

In the female the throat is spotted, and the white of the chest less abrupt.

The Prince of Canino places under this genus, *Tr. Prunelli*, Bourc.; *torquatus*, Boiss.; *Conradi*, Bourc.; and *Wilsoni*, Bourc.

The following descriptions are taken from specimens in Mr. Gould's cabinet.

Trochilus Wilsoni. General colour dusky black, with metallic tints on the shoulders, and upper tail-coverts; chin black; throat-gorget steely violet; sides of the chest before the shoulders with a large spot of white; this is wanting in the female, which has the chest dusky, mingled with white.

Locality: Nova Granada. In Gould's cabinet.

Trochilus torquatus. Plate IV. Forehead black, surmounted by a deeply metallic violet, but short crest; head, throat, upper and under parts dusky black, with green reflexions on the

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BOURCIERIA TORQUATA.



shoulders and under tail-coverts, and also on the throat; two central tail-feathers black, the rest white, abruptly tipped with black—the outer ones more largely.

Locality: Peru. In Gould's cabinet.

Trochilus Prunelli. Dusky, with the shoulders and a small gorget of steely blue; back bronzed; tail and wings black; sides of chest white.

Locality: Columbia. In Gould's cabinet.

Trochilus insectivorus. (*Trochilus insectivorus* Tchudi?) Forehead ornamented with a steely spot; gorget green; a broad white semilunar chest band; general plumage black; under tail-coverts tinged with metallic green; two central tail-feathers black, the rest whitish, tipped with black—the outer ones more largely. Allied to *B. torquata*, but distinct.

Locality: (?) probably Peru. In Gould's cabinet.

In this genus, as is evident from the conformation of the wings and tail, the power of flight must be very considerable.

Genus *AGLÆACTIS*, Gould. The following are the features which characterize this genus:—Beak straight; wings large and powerful, extending beyond the tail; the feathers of the tail are singularly shaped at the extremity, the sharp end of the shaft of each being slightly prominent.

Our descriptions of species are taken from examples in Mr. Gould's cabinet.

Trochilus (Agl.) cupreipennis, Bourcier, Plate V. Top of the head, the back, and shoulders, pale chestnut, washed with sooty black; middle of the back coppery red; upper tail-coverts tipped with green; tail pale chestnut, washed at the tip with sooty black.

Locality: Columbia.

Trochilus (Agl.) Pamela, D'Orbigny. Head, chest, upper part of back, and wings, dusky velvet black: middle of back, and upper tail-coverts, dazzling bluish-green; tail fulvous, tinged at the tip with black. The female has only the upper tail-coverts metallic, the tail being dusky. The male has the feathers in the centre of the chest abruptly tipped with white.

Trochilus (Agl.) caumatnotus, Gould, in Proc. Zool. Soc. 1848. Crown of the head brown; lores, chest, and under surface, cinnamon-brown; throat crossed by a bar of blackish-brown, with which tint the flanks also are clouded; from the lower part of the chest springs a tuft of lengthened feathers, which are dark-brown at the base, and buff at the tip; wings bronzy-olive; tail cinnamon-brown, except on the upper or exposed portion, which is rich bronzy-olive; back and upper tail-coverts shining purplish-lilac, which colour is only seen when the feathers are looked at in the reverse direction.

Total length, $4\frac{1}{2}$ inches; bill, $\frac{7}{8}$; tail, $1\frac{3}{4}$.

Locality: Peru.

Mr. Gould remarks that, in this genus, the



AGLÆACTIS CUPREIPENNIS.



bill is rather short, a little depressed at the base and straight; the nostrils basal; the wings long and powerful; the primaries, particularly the outer one, sickle-shaped; the tail moderately large, and slightly forked when closed; the feet strong and powerful, and the tarsi partially clothed with feathers.

These birds are evidently formed both for rapid (and perhaps a Swift-like) flight, and for tenacity of prehension in the foot. They do not rank amongst the most gorgeous of their tribe.

M. Bourcier describes a species, termed *Aglæactis Castelnaudi*, from Columbia; but we are not ourselves acquainted with it. (Rev. Zool. 1848.)

Genus **FLORISUGA**, Bonaparte. The type of this genus is the *Trochilus mellivorus* of Linnæus—*Mellisuga Surnamensis* of Stephens—a native of Cayenne, Surinam, and the Antilles. It is well described and figured in the Naturalist's Library, Ornith. vol. i. p. 139, pl. 30, under the title of the White-collared Humming-bird. In this genus the beak is arched; the wings moderate; the tail rather short, and composed of broad feathers, divided, as it were, into two opposite sets, forming a rounded fork when closed.

Two other species of this genus are known, viz. *Trochilus ater*, Wied, from Brazil; and *Trochilus flabelliferus*, Gould, from Tobago. The three specimens are in Gould's cabinet.

Trochilus flabelliferus. A most lovely species. In the male, the whole of the head and throat is

of a deep violet-blue; a semilunar mark of white crosses the top of the back; the upper surface generally is golden green; the abdomen snowy-white; the tail is white, each feather being neatly edged at the tip with dusky black; the upper tail-coverts extend to the edge of the tail.

The female is very unlike the male. The top of the head is bronzy-green, and the throat dusky white, with darker spots; the tail is bronzy-green, each feather being edged narrowly at the tip with white. General plumage, dull.

The young males resemble the female, except that the head and throat assume a tint of pale violet, or rather plum colour.

Locality: Tobago.

Trochilus ater. Head, chest, top of back, and abdomen velvety black; flanks and thigh-feathers white; tail white, tipped with black; the two central tail-feathers being of a dull purplish-brown, washed with glossy green; rump and upper tail-coverts black, washed with glossy golden green.

Locality: Brazil.

Genus HYLOCHARIS, Boié (Les Saphirs, Lesson, Smaragdites, Boié). Of this genus the Sapphire-throated Humming-bird (*Trochilus saphirinus*), and the Golden-green Humming-bird (*Ornismya prasima*, Less.), are examples. The former is described and figured in the Naturalist's Lib. Ornith. vol. i. p. 135, pl. 28. It is a native of Guiana, Cayenne, Brazil, and Berbice.

The second species is described in the same work, vol. i. p. 97, pl. 8.

This genus has received the titles *Saphirs* and *Smaragdites* from the prevalence of the colours of these gems on the plumage. The bill is straight; the feet small; the wings are moderate and falciform: the tail rather broad, but not long; it is square, or nearly so, at the apex.

Several new species have recently been described by Bourcier and others. Of these, one of the most remarkable is the *Trochilus Caroli* of Bourcier. The description is as follows: Adult male.—Beak black, straight, and cylindrical; the top of the head, the scapularies, and back of a dull green, slightly bronzed, the throat and chest presenting a gorget of brilliant rufous, with gem-like effulgence; under the eye is a white mark; the lower parts of the body are of a deep grey washed with green; under tail-coverts whitish, grey in the centre. Wings falciform, of a greyish violet. Tail forked; the four intermediate feathers graduated, and of a bronzy-green; the rest black, with violet reflexions; the external have the outer vane at its extremity washed with yellow. Feet black.

The locality, whence the specimen (in the collection of Mr. Edward Wilson) from which M. Bourcier took his description, does not appear to have been ascertained.

Genus *DOCIMASTER*, Gould. This genus con-

tains, as far as known at present, only one species. The beak is enormously long, with a slight upward curve, and is well adapted for probing deep flowers, such as those of the *Brugmansia*. The wings are large; the tail forked; the plumage dull. The females have the throat spotted.

The nest, consisting of a dense texture like fine brown felt, hangs pendent from a twig. It is of large dimensions.

The species representing this genus is the *Trochilus ensiferus*, Boiss. in Rev. Zool. 1839, p. 354. The general plumage is dark bronzed-green; the wings and tail are soot-black; bill and feet black. This species is represented in the frontispiece. [FRONTISPIECE.]

The whole contour of this bird, which ranks among the larger and more powerful of its race, sufficiently attests its extraordinary powers of flight. While probing the long tubular blossoms it suspends itself in the most varied and graceful attitudes; and although less brilliant in colouring than most other species of *Trochilidæ*, it is, nevertheless, one, which, if well displayed even in a cabinet and surrounded by the most dazzling of its race, at once arrests the eye, and excites no common interest.

It is a native of Santa Fé de Bogotá and the elevated district extending southwards to Peru. It may be considered therefore as a mountain bird, adapted for a temperate, or even a cold district, and is probably migratory to a partial

extent. But, on this and other points connected with its economy, we have no positive information. Its pendent nest is a most beautiful piece of workmanship, and of singular solidity. This species has been described by Mr. Fraser in the *Proceeds. Zool. Soc.* January 1840, under the title of *Trochilus Derbyanus*, his specimen, belonging to the collection of the Earl of Derby, having been brought from Santa Fé de Bogotá. His description is as follows:—Male, total length, 8 inches; beak, $3\frac{3}{8}$; tail, $2\frac{1}{4}$. Female, total length, $7\frac{1}{4}$ inches; beak, $2\frac{3}{4}$; tail, 2.

Bill immensely long, and somewhat recurved, equal in length to the head and body; tail moderate, slightly forked; head and upper parts of body green, with golden and bronze reflexions; wings purplish-black; tail blackish, tinted with bronze, the central feathers being the richest; chin and throat dusky, each feather very obscurely tinted with bronze in the middle, and edged with ashy-white; abdomen green; the feathers edged with white, or in parts greyish; those on the chest are whitish, with a large green spot near the apex; under wing-coverts green.

The female has a shorter beak, and there is more white on the under parts of the body; the feathers on the throat and chin are somewhat variegated with yellowish. It has been found at Pichincha in Quito, at an elevation of from 11,000 to 12,000 feet above the sea.

Genus *HELIANTHEA*, Gould, in Proc. Zool. Soc. 1848.

In this resplendent genus the beak is long, straight, or slightly inclining upwards; the nostrils are basal, and covered by the feathers advancing from the root of the bill; the wings are moderately long and powerful; the tail is of medium size and slightly forked when closed; the feet are very small, and the very short tarsi are clothed with feathers. In the birds of this genus the throat and chest are gorgeous green, with a chin-spot of scale-like feathers of intense metallic-blue; all are most resplendent, with a general plumage of iridescent bronze, the flanks being furnished with full large feathers. The females are beautiful, but less so than the males.

As far as is yet known, all are inhabitants of the Cordillerian Andes.

The types of this genus are the *Trochilus helianthea*, Lesson (*Helianthea typica*, Gould, 1848), and *Trochilus Bonapartii*, Bourc. 1842.

We shall here describe two new species from Mr. Gould's collection.

Helianthea Eos, Gould, Plate VI. In the male, the crown of the head is black, with a shining spot of metallic golden-green on the forehead. The forepart of the neck and chest are of a lustrous golden-green, this golden-green predominating on the lower part of the chest. On the centre of the throat a patch of deep rich blue. Abdomen of a brilliant flame colour. Back,

Gen. *HELIANTHUS*, found in Proc. Zool. Soc. 1842.

In the respective species the head is less depressed, the bill inclining upwards; the nostrils are small, and covered by the feathers advancing from the root of the bill; the wings are not so long and powerful; the tail is of moderate size and slightly forked when closed; the feet are very small, and the very short tarsi are clothed with feathers. In the birds of this genus the throat and chest are gorgeous green, with a chain-spot of scale-like feathers of intense metallic blue; the sides are resplendent, with a glistening array of brilliant bronze; the flanks being covered with blue feathers. The females are beautiful, but less so than the males.

As far as is yet known, all are inhabitants of the Cordillera Andea.

The types of this genus are the *Trochilus helianthus* Lesson (*Helianthus typicus*, Gould, 1848), and *Trochilus Bonapartei*, Bourc. 1842.

We shall here describe two new species from the Bonaparte collection.

Helianthus, Gould, Plate VI. In the male, the crown of the head is blue, with a shining spot of metallic green on the forehead. The forepart of the head and breast are of a bright golden-green, and golden-green predominating on the lower part of the chest. On the centre of the throat a patch of deep rich blue, surrounded by a brilliant flame colour. Back,





wings, and upper tail-coverts bronzy-orange. Tail cinnamon-brown, the apical half of the two middle tail-feathers and the tips of the remainder with a bronzy lustre. Primaries chocolate-brown; secondaries reddish-buff, forming a conspicuous mark on the wing.

The female is similar in colour, but much less resplendent, and entirely destitute of the spot of green on the forehead, and the patch of blue on the throat.

Total length, $5\frac{1}{4}$ inches; bill, $1\frac{1}{2}$; tail, 2.

Locality: the highlands of New Granada and Venezuela.

Helianthea violifer, Gould.

Crown of the head, back of the neck, chin, ear-coverts, and breast green; on the centre of the throat a well-defined lunate mark of luminous violet; back golden-green; lower part of the abdomen and under tail-coverts light rufous. The tail also is light rufous, the tips of the feathers being washed with greenish reflexions; wings purplish-brown, the external edge of the first primary being rufous; bill black.

Total length, $5\frac{7}{8}$ inches; bill, $1\frac{5}{8}$; tail, $2\frac{1}{4}$.

Locality: Bolivia.

Both these species are allied to *Tr.* (*Helianthea*) *Bonapartii*.

Genus PATAGONA, Gray (also *Hylocharis*, in part, Gray).

This genus contains, as far as yet known, only

one species, *Le Patagon*, or *Oiseau-mouche géant* *Trochilus Gigas*, described and figured in the Naturalist's Library, Ornith. vol. ii. p. 50, pl. 3. It is a native of the interior of Chile, and measures nearly 8 inches in total length—being, indeed, a giant among its race. Its forked tail and amplitude of wing prove it to be a bird of most powerful flight. The beak is long, stout, and straight; plumage dull; feet small.

In Chile this bird is called *Picaflor grande*, and according to Mr. Bridges, in Proc. Zool. Soc. 1843, p. 114, it is there found in all the intermediate provinces. It is seen about Valparaiso during the spring and summer months, feeding on the flowers of *Pourretia coarctata* and *Lobelia polyphylla* in preference to others. It generally builds its nest near a little rivulet, frequently on a solitary branch or twig over the water; the nest is beautifully constructed, and is composed of the moss and the down of a species of *Grappalum*. Eggs white; Iris dark brown. Catches flies.

From the Swift-like contour of this bird, with its wings passing when closed beyond the tail, its habit of catching insects on the wing might have been readily predicted; but it is always desirable that theory should be confirmed by observation. In our general account of the Trochilidæ, we have already quoted Mr. Darwin's observations relative to the powers of wing, and the mode of flight of the *Trochilus Gigas*.

Genus METALLURA, Gould, in Proc. Zool. Soc. 1847.

The males in this genus are very brilliant, but the females are much more plainly ornamented. The bill is straight, moderately long, and slender; the general plumage is soft and silky; the tail is rather ample, rounded, its under surface glistening with metallic lustre; the wings are moderately large, and apparently adapted for an easy mode of flight; gorget metallic green, and very luminous; tarsi bare; feet rather large. The female wants the luminous throat mark.

Five recorded species belong to this genus, all in Mr. Gould's cabinet, viz. *Tr. æneicauda*, Gould; *Tr. smaragdinicollis*, D'Orbigny; *Tr. tyrianthinus*, Loddiges; and *Tr. Williami*, Bourcier.

In *Trochilus cupreicauda*, the throat is lustrous bluish-green; the crown of the head, the neck, the back, and all the upper surface, dark lustrous purplish-brown; wings of the same tint, but lighter; under surface of the tail rich fiery copper colour, and very luminous. In some specimens this is of a light rich purplish-copper colour—in others inclining to green. Bill black.

Total length, 5 inches; bill, 1; tail, $2\frac{1}{4}$.

Locality: Bolivia. In Gould's cabinet.

Trochilus æneicauda. Throat luminous metallic green; upper surface mingled green and brown; wings purplish brown; under surface of

the tail luminous brassy-green ; upper surface of the tail metallic brown, changing in some lights into deep indigo-blue ; bill black.

Total length, $4\frac{3}{4}$ inches ; bill, 1 ; tail, 2.

Locality : Bolivia. In Gould's cabinet.

Trochilus Williami. Gorget metallic green ; abdomen dusky, with a green reflexion ; upper surface metallic green ; under surface of tail steel-blue, with changing hues. In *Tr. smaragdinicollis* the gorget is more ample, and of a lighter tint.

Locality : Columbia ; Popayan. In Gould's cabinet.

The birds of this genus are rangers of mountain districts ; but to what elevation they ascend, or whether they restrict themselves to deep gorges, or elevated valleys, is a point not very clear. Further information relative to their habits is yet required.

Genus AVOCETTINUS, Bonaparte (*Les Avocettes*, Lesson).

This beautiful genus contains only two recorded species, both characterized by the sudden turning up of the anterior portion of the bill, reminding us of that of the Avocet (*Recurvirostra Avocetta*, Linn.) of the fens and low coasts of the more eastern parts of our island.

The *Trochilus Avocetta* is described and figured in the Naturalist's Library, Ornith. vol. i. p. 78, pl. 2 ; and the *Trochilus recurvirostris* in

the bill luminous brassy-green. Upper surface of the tail iridescent brown, changing in some light yellow deep into blue. Bill black.

Total length, 22 inches. Bill, 4; tail, 2.

Locality: Britain. In Gould's cabinet.

Trochilus Williamsi. Gorge iridescent green; abdomen dusky, with a green reflection; upper surface of tail iridescent green; under surface of tail steel-blue, with changing lines. In *T. swainsonii*, the gape is more ample, and of a lighter tint.

Locality: Columbia. Peruvian. In Gould's cabinet.

T. Williamsi. The species inhabits the ranges of mountain ranges. As the elevation they ascend, the vegetation they extend themselves to deep gorges, or narrow valleys, is a point not very clear. Further information relative to their habits is yet required.

Genus *Trochilurus*, Bonaparte (*Les Accipitres*, Lacép.).

This beautiful genus contains only two recorded species, characterized by the sudden turning of the anterior portion of the bill round the head that of the *Avocet* (*Recurvirostra americana*, Linn.) of the plains and low coast of the more eastern parts of the land.

The *Trochilus* described and figured in the Naturalist's Library, Smith. vol. i. p. 78, is the *Trochilus recurvirostris* in



CHRYSURONIA AENONE.



the same volume, p. 80, pl. 3. We have nothing to add to the observations therein made.

Genus *CHRYSURONIA*, Bonaparte (*Les Chrysures*, Less. ; *Polytmus*, in part, Gray).

Under this genus the Prince of Canino ranges four species : *Ornismya Ænone*, Lesson ; *Ornismya Chrysura*, Lesson ; *Trochilus Elicia*, Bourcier ; and *Trochilus Phæopygus*, Lichtenstein.

In this genus the bill is slightly recurved ; the feathers of the tail are acuminate, and of a brilliant red golden colour, whence Lesson's term, *Les Chrysures*, or gold-tails. The *Ænone* is a native of Trinidad,—the next two of Brazil, and the fourth of Peru.

Trochilus Ænone, Plate VII. This is a very beautiful species. The head and throat are intense violet ; the back, chest, and shoulders luminous golden green ; the tail refulgent golden bronze ; wings purplish black ; bill very slightly arched, the under mandible red, passing into dusky black at the tip.

Genus *HELIANGELUS*, Gould—(*Mellisuga*, in part, Gray.)

This is a gorgeous group ; distinguished by the extreme lustre of the throat, which, in most species, is bounded below by a gorget of white or buff. All the species are natives of the Andes.

Bill straight, about as long as the head, cylindrical and very slightly depressed at the base ;

feathers of the forehead not advancing upon the bill; wings somewhat powerful, the outer primary being sickle-shaped; feet moderately strong; tail rather round in form, and of medium size. Females plainer.

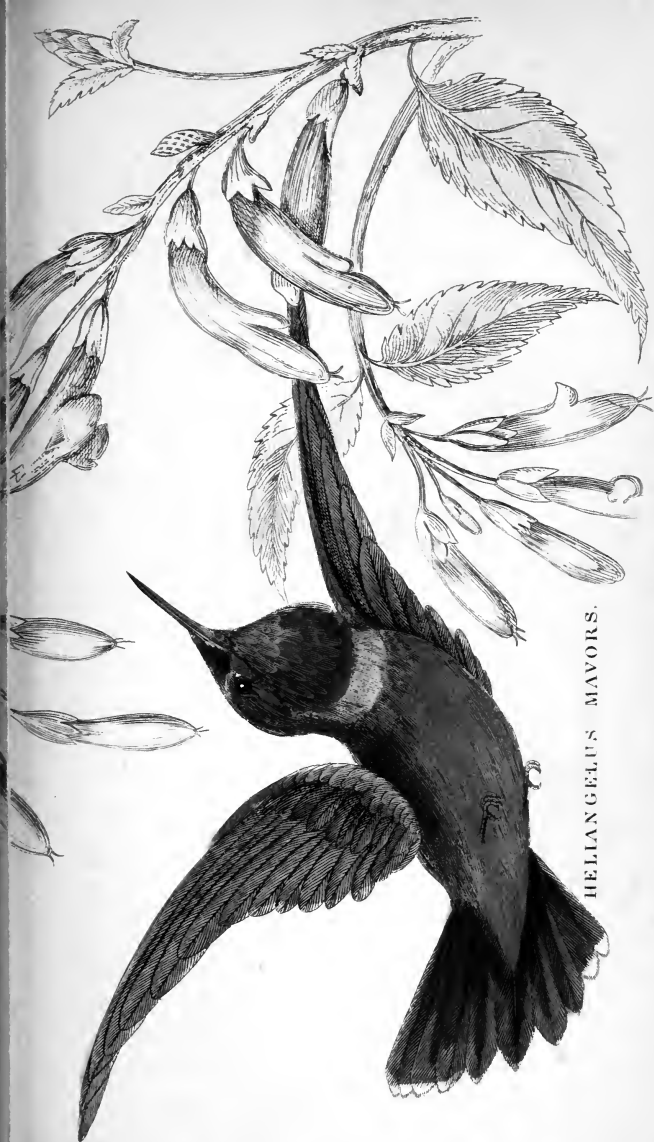
Six species are recorded, of which the most magnificent is the *H. Mavors*, Gould.

Trochilus Mavors, Auct. Pl. VIII. In the male, the crown of the head and all the upper surface is of bronzy green, except the forehead, on which is a narrow mark of deep fiery red; throat deep fiery red, bounded below by a broad crescent-shaped mark of buff, which colour, but of a somewhat deeper tint, pervades the whole of the abdomen; but the flanks are washed with green; under tail-coverts greyish buff; wings purplish brown; the two middle tail feathers bronzy green; the remainder bronzy brown; the two outer ones on each side being obscurely tipped with white; tarsi dark brown; bill blackish brown.

Length, $3\frac{7}{8}$ inches; bill, $\frac{3}{4}$; tail, $1\frac{5}{8}$.

Locality: the Cordilleras of Venezuela, and New Granada. In Gould's cabinet.

Helianthus strophianus, Gould. In this lovely species, a luminous spot of green ornaments the forehead immediately above the bill; the rest of the head, all the upper surface and the abdomen are dull green; the throat is of a rich violet blue, separated from the green of the abdomen by a broad semi-lunar band of white: all the tail feathers are black; the wings blackish



HELLANGELUS MAVORS.



brown with purple reflexions ; under tail-coverts white ; bill black.

Length, $4\frac{1}{2}$ inches ; bill, $\frac{3}{4}$; tail, $1\frac{3}{4}$.

Precise locality not ascertained. In Gould's cabinet.

Heliangelus Spencei (*Trochilus Spencei*, Bour. in Proc. Zool. Soc. 1847).

The male has the beak black, straight and cylindrical ; the forehead is adorned with scaly feathers of a silvery greenish blue ; top of the head and neck velvet black ; the gorget consisting of scaly feathers, is of a metallic purplish-violet, bordered below by a white band. The general tint above and below is metallic green. The upper mandible is black, the under mandible white ; lower abdomen brown green.

Locality : Merida. In Gould's cabinet.

Heliangelus Clarissæ (*Trochilus Clarissæ*, Longuem. 1840).

This species is very similar to the preceding ; but the forehead spot is metallic green, and the under tail-coverts are white.

Locality : Santa Fé de Bogotá. In Gould's cabinet.

The other species of this genus are, *Ornismya Parzudaki*, Lesson ; and *Trochilus amethysticollis*, D'Orbigny.

Of the habits of these "Messengers of the Sun," we have little positive information ; we know, indeed, that they tenant mountain elevations, and are powerful on the wing, but the elevation to which they ascend, and the pecu-

liarities of their economy, are yet to be ascertained.

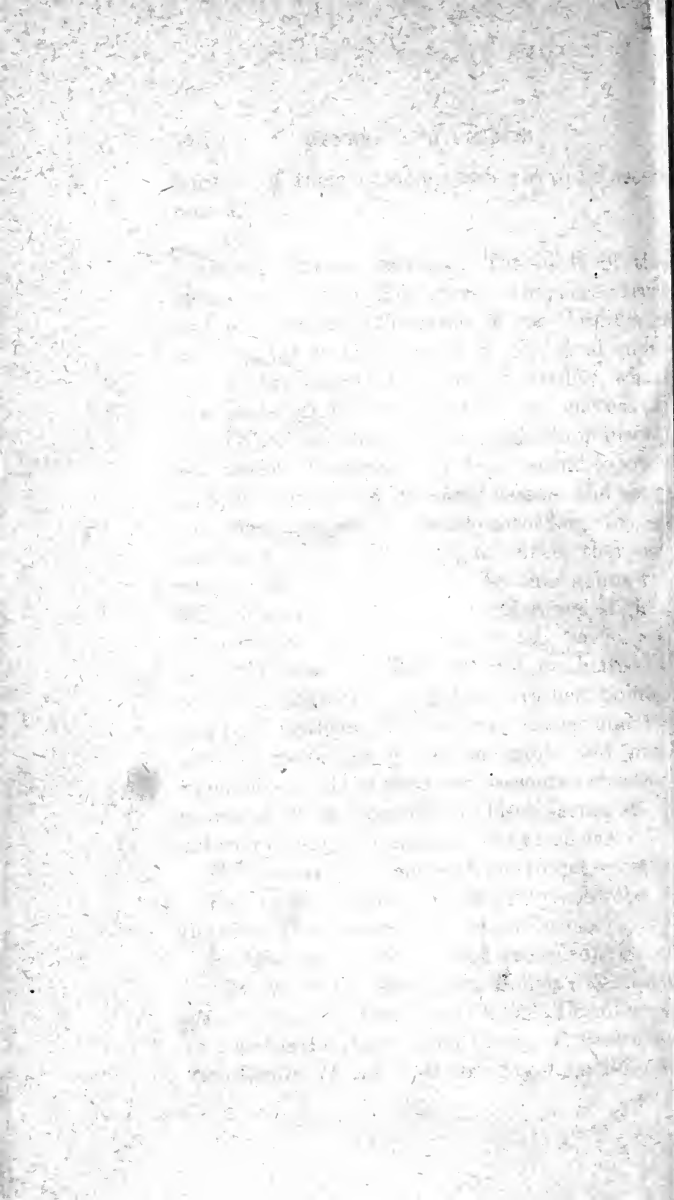
Genus OREOTROCHILUS. The birds of this genus are termed Hill stars; they are truly *Nivicolæ*, tenanting the range of the Cordilleras, as high up as the margin of perpetual snow. Below this margin is a belt of fertility, where thousands of flowers, opening in succession, afford them an abundant supply both of insects and nectar. Most probably they descend to lower altitudes during the inclement season, and regulate their degree of ascent according to the unfolding of the blossoms, to which they are more especially attracted. In this genus the bill is longer than the head, slender, and slightly arched; the wings are moderately large and powerful; the tail is large, and graduated or rounded, consisting of narrow, rather pointed and rigid feathers; the feet are strong and the tarsi plumed; the gorget is ample and most splendid;—and the abdomen presents a chestnut brown or black longitudinal fascia, acute at its anterior origin, and more or less extensive.

The females are plain, with the throat spotted.

The nest is usually attached by cobwebs to the sides of rocks, or to blocks of stone.

Six species are at present recorded, viz.:—*Tr. Estella*, D'Orbigny, from Bolivia; *O. leucopleurus*, Gould, from the Chilian Cordilleras; *T. Chimborazo*, Bourc. from Lima; *T. Pichincha*, from Quito; *O. Adela*, D'Orbigny, from Bolivia;





OREOTROCHILUS CHIMBORAZO.

Pl. 9.





and *O. Melanogaster*, Gould, from Bolivia. All in Gould's cabinet.

Trochilus (Oreotrochilus) Chimborazo, Plate IX.

Back and wings dusky; two middle tail feathers dusky, the rest white tipped and edged with dusky; forehead steel blue, or intense violet; chest the same, enclosing a gorget of intense green, bounded by a stripe of velvet black; under parts white; with a longitudinal stripe of black down the abdomen; under tail-coverts dusky black. Females plain, with the throat dusky, laterally tinged with blue.

Trochilus (Oreotrochilus) leucopleurus, Gould.

Head, all the upper surface, and wings, greyish olive brown, passing into dull coppery green on the upper tail-coverts; two centre tail feathers green, with bronze reflexions; lateral tail feathers dull white, margined externally and tipped with dull brown; throat, rich luminous grass green, bounded below by a crescentic band of deep velvety black; breast and centre of the flanks pure white; the remainder of the flanks and centre of the abdomen, bluish black; feet dark olive brown; bill black.

Total length, $4\frac{3}{4}$ inches; bill, 1; tail, $2\frac{3}{8}$.

This species is very nearly allied to *O. Estella*, but differs from it in being somewhat smaller, and in having the centre of the abdomen black instead of chestnut.

Trochilus (Oreotrochilus) Melanogaster, Gould.

All the upper surface brown, with a golden lustre,

and washed with green on the upper tail-coverts; wings greyish brown, with purple reflexions; throat rich lustrous grass green; breast and abdomen rich deep bluish black; flanks rusty brown; tail green, with bronze reflexions; bill black; feet olive black.

Total length, 5 inches; bill, 1; tail, $2\frac{1}{4}$.

It is most probable that many new species will be hereafter added to this genus, which is as well defined in form and general features as it is in its habits;—not that there are no other Humming-birds, to which the term *Nivicolæ* is applicable: but in this genus, every species is a tenant of the highest habitable range of the snow-clad mountains, and builds its nest on the face of craggy precipices.

Genus THALURANIA, Gould in Proceed. Zool. Soc. 1848.

In this genus the males are gorgeous, the females plain. The throat gorget is generally metallic green, succeeded by metallic blue; the nest is compact, placed on a twig, and coated most elegantly with lichen; the beak is acute, longer than the head, and slightly arched; the wings are rather small; the tail is ample, and more or less forked; the feet are small and delicate, and the tarsi are clothed with feathers.

The type of this genus is the Fork-tailed Humming-bird, described and figured in the Naturalist's Lib. Ornith. vol. i. p. 125, pl. 24.

It is the *Ornismya furcata* of Lesson. Another species is the *Trochilus Wagleri* of Lesson, described in the same work, vol. ii. p. 83, pl. 16. (*Trochilus sapphirinus* of Vieillot?)

As farther examples of this lovely group we select the following species from Mr. Gould's cabinet.

Trochilus (Thalurania) nigrofasciatus, Gould. This species is nearly allied to *Ornismya furcata*. The throat is lustrous green; the abdomen and edge of the shoulders are shining blue, separated from the green of the throat by a lunate band of black; head and back of neck bronze green; back and wing-coverts brownish green; wings brown; tail considerably forked, and of a dull steel blue; bill black.

Total length, $4\frac{1}{4}$ inches; bill, $\frac{7}{8}$; tail, $1\frac{7}{8}$.

Locality: Rio Negro, Brazil.

Trochilus (Thalurania) Watertoni (*Trochilus Watertonii*, Bourcier, from Loddiges' MSS. Med. Proc. Zool. Soc. 1847). In the male, the beak is black and rather stout, almost straight; the head is covered with scaly feathers of a golden-green; the back and shoulders are of a brilliant violet blue; the tail-coverts greenish blue; the throat gorget is brilliant green; the under parts deep blue; under tail-feathers blackish blue; wings falciform, and black blue; the tail is very decidedly forked, the feathers being regularly graduated from the central pair to the outermost; colour violaceous black blue.

Locality : Guiana, along the River Essequibo and its tributaries.

Trochilus (Thalaurania) Viridipectus, Gould, 1848.

In this species all the upper surface is bronzy-green, passing into bright grass green on the lower part of the back; upper and under tail-coverts and tail steel bluish black; throat and chest resplendent grass green; abdomen bright blue; tarsi clothed with feathers; bill black.

Total length, $4\frac{1}{2}$ inches; bill, 1; tail, $1\frac{3}{4}$.

Locality : the Columbian Andes. In Gould's cabinet.

This species is nearly allied to *Tr. nigrofasciatus*. To the present genus belongs the Blue-fronted Humming-bird (*Trochilus glaucopsis*; *Tr. frontalis*, Latham), described in the Naturalist's Lib. Ornith. vol. i. p. 86. It is a native of Brazil. In Gould's cabinet.

Trochilus (Thalaurania) Schreibersi, Lodd.

In the adult male the beak is black, stout, and slightly arched at its extremity; the head and all the upper parts of the body of a glossy golden green; from the commissure of the beak a narrow line of yellow feathers is prolonged; the throat is clothed with black silky feathers, passing into brilliant lustrous violet on the forepart of the neck. Feathers of the chest scale-like and of a brilliant green; abdomen deep golden green; under tail-coverts black, with green reflexions; wings falciform, and of a grey-

ish black; tail slightly forked, the feathers being broad and pointed, their colour is bluish black, the shorter central ones having a green reflexion; feet black.

The birds of this genus are mostly natives of Brazil; one, however, *Tr. Cyanifrons*, is a native of the elevated region of Peru; another, *Tr. Watertoni*, of the banks of the Essequibo; and a third, *Tr. Viridepectus* of the Columbian Andes.

When such differences of geographic locality are presented to us, necessarily involving as manifold a difference in the character and features of each respective region, from the alluvial banks of the Essequibo, or the forest-belted Rio Negro, to the Columbian Andes, we cannot but suppose that, in the birds of this group, a parallel diversity of habit must exist. Unfortunately the economy of each species has not been diligently studied; no accounts founded on personal observation afford us that kind of knowledge which is so universally interesting. Hence it is that every scrap of information relative to the habits of the Trochilidæ, apart from the birds of the present genus, is received with gratitude. Here a field of not unprofitable labour is open to the ardent ornithologist whom circumstances may permit to devote himself to the task.

Genus SAUCEROTTIA, Bonaparte, (*Polytmus*, in part, Gray).

This genus is established by the Prince of

Canino, who takes the *Trochilus Saucerottii* of Bourcier (*Saucerottia typica*), in Rev. Zool. 1846, as his normal standard.

To this form belong the Crimson-rumped Humming-bird, *Ornismya Erythronotos*, Lesson, described in the Nat. Lib. Ornith. vol. ii. p. 89; Neuwied's Humming-bird, *Trochilus Cyanogenys*, idem, p. 89; and the Atala, *Ornismya Atala*, idem, p. 90. Mr. Gould describes a species under the title of *Trochilus (Saucerottia) caligatus*, and which is closely allied to *Tr. Saucerottii*. In this species the crown of the head and the upper surface are green; the throat and all the under surface resplendent grass-green; wings purplish black; upper tail-coverts and tail bright steel-blue; under tail-coverts the same, fringed with white; thighs and tarsi clothed with snow-white feathers.

Total length, $3\frac{1}{2}$ inches; bill, $\frac{7}{8}$; tail, $\frac{3}{8}$.

Locality: New Granada. In Gould's collection.

Genus AMAZILIUS (*Polytmus*, in part, Gray.) Bonaparte.

In this genus the bill is dilated at the base, and nearly straight. The tail consists of equal feathers, elongated, and pointed. The type is represented by the *Ornismya Amazilii* of Lesson (*latirostris*, Swainson). It is a native of Peru.

We shall here describe the *Trochilus (Amazilius) Norrisii*, of Bourcier, in Proceed. Zool. Soc. 1847.

In the adult male, the almost straight beak is of a whitish colour, black towards its extremity ; the head, the neck, the shoulders, and the back are pale golden green ; the upper tail-coverts pale greyish-green. The gorget consists of scaly feathers of a brilliant golden green ; the chest is snowy white ; the abdomen and flanks are light yellow ; the under tail-coverts greyish-white ; the wings, almost straight, are of a pale grey ; the tail pale glossy greyish-green ; the feet are whitish.

Locality : Guayquil, Peru.

The Prince of Canino enumerates thirteen species as belonging to this genus, of which one, the *Trochilus flavescens* of Loddiges, he regards as abnormal.

The general colour of this species is golden-green ; the head and throat are golden smaragdine ; the tail slightly forked, and of a yellowish-white ; the two middle feathers altogether golden olive, and the rest margined with this colour ; wings brownish-black ; beak of moderate length, and straight.

Locality : ? In Gould's cabinet.

The two preceding genera present us with several species of which little is known, and which still require careful revision. Of their habits we can say nothing with certainty.

Genus THAUMATIUS, Bonaparte (*Les Eme-raudes*, Lesson ; *Basilinna*, in part, Boié ; *Polyt-mus*, in part, Gray).

The type of this genus is the *Trochilus Thaumatus*, Linn. (*Ornismya albiventris*, Lesson). In this genus the beak is straight; the tail square, or a little forked; the wings moderate.

As examples of this genus, we may instance the White-eared Humming-bird (*Trochilus leucotis*, Vieill.) described and figured in the Naturalist's Library, Ornith. vol. i. p. 137, pl. 29; the Blue-green Humming-bird (*Trochilus cyaneus*, Vieill.) described and figured in the same work, vol. i. p. 95, pl. 7; the Sapphire and emerald Humming-bird (*Trochilus bicolor*, Gmelin), described in the same, vol. ii. p. 84; and the Ourissia (*Trochilus Ourissia*, Linn.; *Ornismya Maugei*, Less.), described in the same, vol. ii. p. 85.

A new and beautiful species is the *Trochilus Millerii* of Loddiges, described by M. Bourcier in the Proceeds. Zool. Soc. 1847.

Adult male:—Beak straight, cylindrical, white at the base of the under mandible; top of the head and sides of the neck covered with silky feathers of a brilliant grass green; shoulders, back, and upper tail-coverts, glossy golden green; throat, chest, abdomen, and under tail-coverts, milky-white; flanks spotted with golden green: wings moderate, of a violet grey; tail slightly forked, with narrow feathers of a pale grey-green, spotted transversely with brown towards their extremity; the two central tail-feathers are rounded, and without spots; feet black.

Locality : Brazil, Rio Negro.

In this species we have a normal example of the genus. The following note by Mr. Bridges, communicated to the Zool. Soc. in 1843, by Mr. Fraser (specimens of the birds accompanying the note), is not without interest.

“*Trochilus Milleri*, Lodd. Picaflor de la Cordillera. This beautiful and rare species of Humming-bird is only found in the elevated valleys of the Andes, residing among storms of hail, rain, and thunder, and in places where the Naturalist would least expect to find a species of *Trochilus*. It subsists more upon small flies than upon the nectar of flowers. On the examination of the crops I found them filled with flies, which they take *before sun-down, along the margins of the mountain rivulets*. The specimens in the present collection were taken at Los ojos de Agua, province of Aconcagua, at an elevation of from 6000 to 8000 feet; and I saw them at least 1000 feet above that place. Iris brown.”

Here then we have an example of a Humming-bird which pursues its prey on the wing along the mountain water-courses, not so much by day, as at that time “when evening draws o’er all her gradual dusky veil;” and herein are we borne out in our previous observations as to the crepuscular habits of many species, to whom insects rising from the water and the bordering herbage in evening are as attractive as they are to the swallows in our island. In this short

note we have a condensed history; and it is to be desired that such notes should accompany every species transmitted by collectors to Europe.

Genus RAMPHOMICRON, Bonaparte, (*Mellisuga*, in part, Gray).

Eight or nine species of the group (the whole known) are in Mr. Gould's cabinet; but some are abnormal, and will most probably be placed hereafter under another generic head.

In this genus the beak is very small, fine, and short; the tail is forked; the wings are small, and the gorget is effulgent.

The type of this genus is the *Trochilus* (*Ornismya*) *microrhynchus*, Boiss. (*Tr. brachyrhynchus*, Fraser, 1840).

Beak shorter than the head; tail short and black, with a slight copper and bronzy lustre; the two outer tail-feathers on each side somewhat exceed the rest in length, and are white at the tip; the upper parts generally are of a golden-green; the under parts white, occasionally washed with yellowish, and adorned with green and gold spots; primaries of the wings dusky purple.

Total length, $3\frac{5}{12}$ inches; beak, $\frac{3}{4}$; tail, $\frac{7}{12}$. The latter acutely pointed, and a little dilated in the middle.

Another typical species is the *Trochilus* (*Ornismya*) *heteropogon*, Boiss. (*Trochilus corruscus*, Fraser, 1840, Pl. X.)

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RAMPHOMICRON HETEROPOGON.



Beak about equal to the head in length ; tail slightly forked, the feathers being very broad ; general colour of the upper parts green, with golden reflexions ; upper tail-coverts coppery ; under parts dull brownish green ; tail-feathers above and beneath rich bronze with golden brown reflexions ; primaries dusky with purple reflexions ; a pencil or tuft extending from the chin to the chest is composed of compact brilliant feathers ; those on the chin and throat are green, and those beyond are long and narrow and of a purplish red, exhibiting bluish reflexions ; under tail-coverts brownish-yellow.

The female is deficient of the flame-like mark on the throat.

Length, $5\frac{1}{2}$ inches ; beak, $\frac{3}{4}$; tail, $2\frac{1}{2}$.

Both of the above species are natives of Santa Fé de Bogotà.

In the Proceed. Zool. Soc. Mr. Fraser describes a species (locality not stated) under the title of *Trochilus melanogenys*, which Bonaparte regards as abnormal.

In this species the head and upper parts of the body are golden-green ; the abdomen ochreous white, obscurely spotted with golden green ; the sides washed with rufous ; the cheeks black, with a yellowish white line behind the eyes ; the feathers of the throat have each a black spot at the tip, terminating a longitudinal streak ; tail rather short, blackish above, with bronzy reflexions, passing into deep purple black towards the

tip, which is yellowish white, the two middle tail-feathers excepted; wings dusky, with a tinge of violet; the base of the lower mandible and the feet yellow.

Total length, $4\frac{3}{4}$ inches; beak, $1\frac{1}{8}$; tail, $1\frac{3}{4}$.

Locality: In the Earl of Derby's cabinet.

Mr. Gould, in Proceed. Zool. Soc., describes two species, viz. *Trochilus* (*Ramphomicron*) *ruficeps*, a normal species, thus characterized:—Crown deep rusty-red; throat lustrous bronze-green; under surface brownish green; tail large and forked, and of a pure bronze; wings purplish brown; bill black.

Total length, $3\frac{3}{4}$ inches; bill, $\frac{3}{4}$; tail, 2. Mr. Gould remarks that this species is nearly allied to *T. heteropogon*, but is much smaller. In Gould's cabinet.

Trochilus (*Ramphomicron*?) *inornatus*. All the upper surface bronzy-green; under surface brown, with bronzy reflexions on the flanks; feathers of the throat tipped with cerulean blue; wings and tail bronzy, the feathers of the latter tipped with buff; bill black.

Total length, $3\frac{5}{8}$ inches; bill, $\frac{5}{8}$; tail, $1\frac{1}{2}$. Abnormal.

Both the above species inhabit Bolivia. In Gould's cabinet.

Mr. Gould, in addition to those recorded, possesses a new species, *Ramphomicron Stanleyi*, as yet to be described. The birds of this genus appear to be tenants of mountain elevations;

but we have no positive information relative to the habits of any given species.

Genus OXYPOGON, Gould. (*Mellisuga*, in part, Gray.)

The birds of this genus are termed Warriors, or Helmet-crests, and are at once remarkable for the long pointed plume which sweeps over the head, and the elongated feathers of the throat, which advance before the chest like a long dagger-like beard.

Beak short and sharp, a dark frontal mark ; the head being ornamented with a peaked crest of long slender feathers, those of the centre being white, the outer ones black ; black being also the colour of the sides of the face and neck ; the throat is furnished with long white feathers, more or less spotted on the chin, or tinged with green ; wings moderate ; tail ample and even ; or somewhat forked when closed ; the shafts of the outer tail-feathers white ; general plumage dusky ; feet, strong. The females are very plain, with little or no crest, or long pendant throat feathers ; the chest is spotted. In our notes, taken while investigating Mr. Gould's cabinet, we observe,—it is possible that these almost crestless specimens may be young males ; a doubt therefore exists as to the crests of the females.

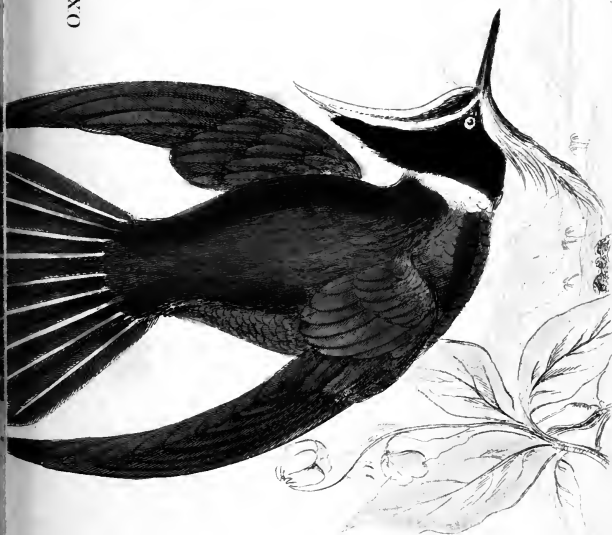
The types of this genus, which contain but very few species, are the *Ornismya* (*Oxypogon*) *Guerini*, Boiss : see Gould in Monagr. Trochil.

part i. t. 11, and *Ornismya (Oxypogon) Lindeni*, Parzudakij: see Gould's Monogr. Trochil. part i. t. 12.

A third species is the *Oxypogon paroirostris*, Fraser in Proceeds. Zool. Soc. 1840; if indeed it be not the young, as Bonaparte believes, of *O. Guerini*. Mr. Fraser regarded his specimen either as an immature male or as a female of some undetermined species. Mr. Gould regards it as the immature of *O. Guerini*

Trochilus (Oxypogon) Guerini, Gould. In this species termed Guerin's Helmet-crest, the head and chest of the male is brownish black, with a narrow line of white down the centre, joined on the forehead by two lines of white, which proceed thence along each side of the base of the bill; on the centre of the throat is a similar lengthened tuft of white feathers, down the middle of which is a line of rich shining green; the black of the head is bounded on the sides and in front by a broad mark of buffy white; upper surface, wing-coverts, and two central tail feathers, bronzy-green: the latter with the basal two-thirds of their shafts white; lateral tail feathers, coppery bronze, with a stripe of white down the centre, which increases in extent as the feathers recede from the centre, until on the outer feather it becomes of a broad spatulate and incurved form; wings purplish brown; under surface light olive brown, with bronzy reflexions on the flanks; under tail-

OXYPOGON LINDENI.





coverts light olive brown ; bill and feet blackish brown.

Total length, $4\frac{1}{2}$ inches ; bill, $\frac{1}{2}$; tail, $2\frac{1}{4}$.

The females resemble the males in general colour ; but are less brilliant, smaller in size, have the throat and crest plumes much less developed, and moreover, have no black feathers in the crest.

Locality : the higher regions of the Columbian Andes ; Santa Fé de Bogotá. In Gould's cabinet.

This is the Warrior of collectors.

Trochilus (oxypogen) Lindeni, Plate XI. Linden's Helmet-crest, so called in honour of its discoverer, M. J. Linden, of Luxembourg, may be thus described.

The adult male has the head and lengthened crest black, with a narrow stripe of feathers down the centre of the latter, joined on the forehead by two lines of white, which proceed along each side of the base of the bill ; down the centre of the throat depends a similar elongated tuft of white feathers, in the middle of which there is a faint indication of the rich shining green mark so conspicuous in Guerin's Helmet-crest ; the black of the head is bounded at the sides and in front by a broad band of white. Upper surface, wing-coverts, and two tail-feathers, bronzy-green ; the latter with a narrow line of white down the basal portion of the shaft ; lateral tail-feathers coppery bronze, with the basal portion of the shafts white, which

is somewhat broader on the outer feather on each side than on the others; under surface of the tail bronzy purple; wings purplish brown; under surface olive brown, with bronze reflexions; under tail-coverts bronzy green, narrowly edged with white; bill, feet, and eyes, brownish black.

Total length, $5\frac{1}{2}$ inches; bill, $\frac{5}{8}$; tail, $2\frac{1}{2}$.

Locality: Cordilleras of Columbia.

The female is smaller than the male, with the head and upper surface coppery brown; the throat is mottled with white and coppery feathers; flanks, coppery brown, with greenish reflexions. In Gould's cabinet.

In a communication from Mr. Linden to Mr. Gould, relative to this interesting species, the following graphic passage occurs, which we transcribe from the Monograph of the Trochilidæ.

"I met with this species for the first time in August, 1842, while ascending the Sierra Nevada de Merida, the crests of which are the most elevated of the eastern branch of the Cordilleras of Columbia. It inhabits the regions immediately beneath the line of perpetual congelation, at an elevation of from 12,000 to 13,000 feet above the level of the sea. Messrs. Funck and Schlem found it equally abundant in the Paramos, near the Sierra Nevada, at the comparatively low elevation of 9000 feet. It appears to be confined to the region between the 8th and 9th

degrees of north latitude. It occasionally perches upon the thinly scattered shrubs of this icy region, such as the *Hypericum*, *Myrtus*, *Daphne*, arborescent *Espeletias*, and, towards the lower limit, on *Bejarias*, but most frequently upon the projecting ledges of rocks near to the snow. Its flight is swift, but very short; when it leaves the spot upon which it has perched, it launches itself obliquely downwards, uttering at the same time a plaintive whistling sound, which is also occasionally uttered while perched. As well as I can recollect, I never heard it produce the humming sound made by several other members of the group, nor does it partake of their joyous spirit and perpetual activity. Neither myself nor Messrs. Funck and Schlim were able to discover its nest, although we all made a most diligent search. Its food appears to consist principally of minute insects, all the specimens which we procured having their stomachs filled with small flies."

This species is the Black Warrior of collectors and dealers in objects of natural history.

The birds of this genus, although not adorned with effulgent plumage, are nevertheless very attractive, both from the contrast and arrangement of their colours, and from their long peaked crest, and throat-tuft.

Genus *LODDIGESIA*, Gould, 1850. (*Mellisuga*, in part, Gray).

Bill straight, plumed at the base; tail, apparently consisting of four filamentous feathers, terminating in an abrupt racket-shaped disk of long barbules; the central tail-feathers, (for the number is really normal,) are rudimentary and concealed. One species of this genus is recorded.

Trochilus mirabilis, Loddiges, described by M. Bourcier in Proceeds. Zool. Soc. 1847.

Adult male. Beak black, straight, cylindrical, feathered at the base; top of the head, with an oval space of brilliant light blue; shoulders, back of the neck, back and upper tail-coverts, golden-greyish green; gorget, intensely brilliant green, with blue reflexions in the centre, and terminating in a point on the chest; from this is continued a band of black feathers, relieved by golden reflexions, extending to the lower part of the abdomen; sides of the neck and flanks, white; wings, somewhat incurved, of a violet-grey. The tail appears only to consist of four feathers, the others being rudimentary and non-apparent. These external feathers are in the form of long filaments, describing a demi-circle, and destitute of a vane for the greater part of their length, but they terminate in a long rounded vane resembling a racket. Their colour is violet black; they cross at their base and towards their centre, representing the letter C repeated and opposed one letter against the other. The central tail-feathers are narrow and

pointed, and of a glossy pale green ; feet black, naked.

Locality : Chachapoyas, Peru.

Genus SPATHURA, Gould, (*Platurus*, in part, Lesson). In some respects, as regards the form of the tail, this genus is allied to *Loddigesia*, but not as regards the feet.

The genus *Spathura* is peculiar to the Cordilleras. The tarsi are enshrouded in a large muff of fine down, varying in colour from white to rufous ; the tail is deeply bifid, the outer feather on each side being elongated, and running into a setaceous filament, but ending in a somewhat oval expanse or palette ; the feet are minute ; bill straight and slender ; wings, small and delicate ; throat, gorgeous green. The females are plain and have the chest spotted ; and the tail is squared and short, or slightly bifid. The tarsi have muffs, varying in fulness.

These birds during flight continually open and shut the tail fanwise, and the spatulate ends of the outer feathers in the male are in a state of continual vibration. These birds are commonly termed Racket-tails.

The type of this genus is *Ornismya (Spathura) Underwoodii*, Lesson ;—the Rough-legged Racket-tailed Humming-bird, described and figured in the Naturalist's Lib. Ornith. vol. ii. p. 110, pl. 22. The tarsal muffs are not sufficiently voluminous and downy as represented

in the figure, and the notice of them in the description is liable to objection. They are soft, full, and snowy white. For this reason we subjoin the following description, with a plate of the species, from a specimen in Mr. Gould's collection.

Trochilus (Spathura) Underwoodii. Plate XII.

Top of the head, back, and upper parts in general, of a rich golden green; a band of white crosses the rump. The throat and chest are covered with scale-like feathers, of a refulgent emerald-green; abdomen, dusky green; tarsi, clad in full soft downy muffs, of snowy white, obscuring the toes; tail, deeply forked, the outer tail-feather on each side running out to a great length, becoming filamentous as it proceeds, and terminating in a racket-shaped expanse or vane; the external margin of these long tail-feathers is white.

This species is a native of Santa Fé de Bogotá, and the Caraccas. Until recently its locality was unknown.

Trochilus (Spathura) Addæ, Bourcier (*Tr. rufocaligatus*, Gould, 1846.)

Throat and fore part of the neck luminous metallic-green; plumage of the body bronzy-green; wings brown; tarsi clothed with a thick muff of rusty red down; tail, brown; the outer feathers prolonged and narrow, and ending in a broad spatulate tip. Bill black.

Total length, $4\frac{1}{2}$ inches; bill, $\frac{3}{4}$, tail,



SPATHURA UNDERWOODII.



Locality : the mountain ranges of Bolivia.

Trochilus (Spathura) Peruana, Gould. The Peruvian Racket-tail is an extremely rare species, a few examples only having been brought to Europe.

The male has all the upper and under surface bronzy-green ; the throat and chest are rich metallic green ; the wings and tail brown ; the spatules of the lateral tail-feathers are black, with green reflexions ; the foot-muffs are rufous ; bill black ; toes yellow.

Total length, 5 inches ; bill, $\frac{5}{8}$, tail, $3\frac{1}{8}$.

The female has the upper surface bronzy-green, this colour predominating on the two central tail-feathers ; the lateral tail-feathers are brown, the outer one on each side tipped with white ; under surface white, spotted on the throat, sides of the neck and flanks with pale shining green ; tarsal muff, and under tail-coverts deep buff ; bill black ; feet yellowish brown.

Locality : Peru. In Gould's cabinet.

We learn from Mr. Gould that Dr. Tschudi procured only three examples during his travels in Peru ; the first between the eleventh and twelfth degrees of south latitude on the mountain of Moyabamba, where it was fluttering around the flowers of a new species of *Cactus* ; the second on the road from Santa Maria de Cruces to Andamarca, in the province of Tanja, on the banks of the little river Ancasyacu ; and the third at Chilpes, on the mountain of Veloe,

in the province of Parma, at an elevation of more than 3000 feet. So scarce is this species, that, according to Dr. Tschudi, it was not even known to the Indian hunters of Moyabamba. Upon examining their stomachs they were found to contain the remains of small hymenopterous insects.

It may be asked, why it is, that, in the species of this genus (and of the next in succession), the males only should have the tarsi enveloped in an exuberance of down. We can only say that it is part and parcel of that law which gives to them the superiority in general splendour of plumage, and with this answer we must rest content. The peafowl and the pheasant are examples in point; this law, however, is not quite universal.

Genus *ERIOPIUS*, Gould, 1849. (*Vestipedes*, in part, Lesson.)

As in *Spathura*, the birds of this genus have the tarsi fully muffed,—but the tail is short and broad, or but slightly forked.

Beak moderate, straight; general colour, metallic-green; tarsi tufted to the toes with a full muff of most delicate down, either snow-white, dusky-black, buff, or partly buff and white, shaded into each other; toes small; wings moderate; but deep at the base; tail, short and broad.



ERIOPUS CUPREIVENTRIS.



Locality : Cordilleras, Peru and Columbia.

Of this genus fourteen or sixteen species are now recorded.

The following brief but characteristic descriptions are taken from specimens in Mr. Gould's cabinet.

Trochilus (Eriopus) Derbyi, Bourcier, 1846.

Upper and under surface bronzy-green ; tail short and black, with pointed outer feathers ; upper and under tail-coverts resplendent green.

Locality : Popayan.

Trochilus (Eriopus) Aureliæ, Bourcier, 1846.

Tail more ample than in *E. Derbyi* ; general plumage, dull metallic-green : feet-muffs, white before, tawny buff behind.

Locality : Bogotá.

Trochilus (Eriopus) vestitus, (*Ornismya vestita*, Longuem.)—Foot-muffs, ample and white ; general plumage above, metallic-green ; gorget metallic-plum colour ; under parts, dusky, passing into intense green ; tail short, but broader than in *E. Derbyi*.

Female with indications of gorget.

Locality : Santa Fé de Bogotá.

Trochilus (Eriopus) cupreiventris, Fraser, 1840.

Plate XIII.—Foot-muffs, white ; gorget green, passing on the abdomen into rich bronzy-copper ; tail, short and forked, black ; under tail-coverts steely-violet blue ; upper parts golden-green, passing into a purer green on the upper tail-coverts.

"This species is remarkable for the richness of its colouring: in certain lights it appears as if it were powdered with gold and copper-coloured particles; the coppery hue prevails most on the abdomen; and the upper tail-coverts are of a purer green than the other parts."—*Fraser*.

Locality: Santa Fé de Bogotá.

Trochilus (Eriopus) Luciani, Bourcier, 1842.

This species is allied to *E. cupreiventris*, but the forehead is tinged with blue; the abdomen is altogether green; the under tail-coverts are steel-blue, with a tinge of violet.

Locality: ?

Trochilus (Eriopus) Mosquera, Bourcier, 1842.

General tint bronzy-green; tail rather large and forked; feet-muffs white.

Locality: New Granada.

Trochilus (Eriopus) Aline, Bourcier, 1842.

Feet-muffs, ample and white; general colour, above dull green; under parts, effulgent metallic-green, with a whitish chest-spot, more or less spotted with green; tail short.

Locality: Columbia.

Genus CYNANTHUS, Swainson in part, (*Lesbia*, Lesson. *Mellisuga*, in part, Boié.)

In this genus the bill is straight, or very slightly curved, and the tail very much forked. The Nuna Humming-Bird, *Trochilus Nuna*, is an example. See Naturalist's Lib. Ornith. vol. ii. p. 114.

Trochilus (Cynanthus) Gouldi, Loddiges in Proceeds. Zool. Soc. 1840. General colour green; the throat of a pale smaragdine hue; the tail very long and deeply forked, the outer feathers measuring $4\frac{1}{2}$ inches; their colour is black, golden-green at the tips; the central ones are short; from these the rest graduate, and are of a splendid golden-green; wings moderate; bill small and straight.

“The most remarkable feature in this elegant little bird is its long and luminous green tail, in the form of which, and in the arrangement of the feathers it approaches the Fire-tailed Humming-bird (*Tr. sparganurus*, Shaw), and likewise the Nouna Koali (*Tr. Nuna*) of M. Lesson’s Supplement, pl. 35.”—*Loddiges*.

Locality: Santa Fé de Bogotà. In Gould’s cabinet.

Trochilus (Cynanthus) Mocoa, Bourcier, (*Lesbia smaragdinus*, Gould in Proc. Zool. Soc. 1846.)

Crown of the head luminous green; throat shining steel-blue; body green; the under surface with a metallic tinge; tail very long and forked, metallic-green, highly luminous; has a portion of both webs of the outer feathers, and the inner webs of the remainder black: wings brown; bill, black; allied to *Ornismya Kingii*, Lesson.

Total length, $7\frac{1}{2}$ inches; bill, $\frac{3}{4}$; tail, 5. In Gould’s cabinet.

Trochilus (Cynanthus) gracilis, Gould. in

Proc. Zool. Soc. 1846. Throat beautiful shining metallic-green; the remainder of the body, golden-green; wings brown; tail very long, much forked; the outer feathers bronzy-brown, the bronze gradually increasing in intensity and becoming a brilliant spot at the tip; basal half of the outer webs buffy white, the rest of the feathers brown at the base, and shining golden green for the remainder of their length; bill, black. In Gould's cabinet.

Total length, $6\frac{1}{2}$ inches; bill, $\frac{1}{2}$; tail, $4\frac{1}{2}$.

Habitat. Peru. In Gould's cabinet.

This species, as Mr. Gould remarks, is very closely allied to the *Trochilus Gouldi* of Loddiges, which is synonymous with the *Ornismya Sylphia* cf Lesson, nevertheless, there are constant differential characters which serve to distinguish between them. For example, in this species the bill is shorter, the green of the body ochreous, and the lower part of the abdomen more buffy or not so green as in *T. Gouldi*. The most remarkable difference, however, is in the outer tail-feathers, which are decidedly narrower and not so green.

GENUS COMETES, Gould, 1847. (*Mellisuga*, in part, Gray.)

This genus contains only two species, as far as we yet know, both of supreme magnificence,—meteor-like birds, whose long tail-feathers, as they dart through the clear atmosphere must scatter a halo of radiance around them.

In this genus the bill is long, cylindrical and curved downwards; the tail is much forked, elongated, with the feathers broad and truncate; the tarsi are bare; the feet moderately large.

One species, (*Trochilus sparganurus*, Shaw, *Ornismya Sappho*, Lesson), the Bar-tailed Humming-bird is described and figured in the Naturalist's Lib. Ornith. vol. ii. p. 112, pl. 23. It is a native of Bolivia.

The Sappho is indeed a lovely bird, but it is outvied by the next species.

Trochilus (Cometes) Phaon, Gould, 1847. Male. Head, neck, wing-coverts, and under surface brownish-green; back, upper-tail coverts and tail rich deep lustrous crimson; bases of the tail-feathers blackish-brown; the tips deep velvety-black; wings deep purplish-brown; gorget rich lustrous metallic-green.

Female. Tail of the same colour as that of the male; she also possesses the lengthened and curved bill.

Total length, 7 inches; bill, $1\frac{1}{8}$; tail, 4.

Mr. Gould observes that this magnificent species is a native of Peru, and differs from the Sappho, which inhabits Bolivia, in having the tail rich crimson instead of flame colour, and in the greater length and curvature of the bill.

Both species are denizens of elevated regions, but we are not well acquainted with their general economy.

Genus TROCHILUS, Linn. in part.—Bonap.

Mr. Gould gives to this genus the title of COLIBRI, restricting the generic title of *Trochilus* to the group of which *Polytmus* is the type. Within the genus *Colibri*, he places as the normal species, the *Tr. Colubris*, or Ruby-throated Humming-bird, and also the Nootka Sound species, but only provisionally, as there are differences which may render a generic separation requisite. The Prince of Canino places the Nootka Sound Humming-bird in the genus *Selasphorus*, of which he regards it as the type. Adopting the title *Colibri*, in accordance with Mr. Gould, we may observe that it is characterized by a long straight beak, by a sabre-like form of wing, and by the forked termination of the tail.

The typical example is the Ruby-throat, or Northern Humming-bird, *Trochilus Colubris*, Linn.: described and figured in the Naturalist's Lib. Ornith. vol. i. p. 85, pl. 5. To this species we have already adverted—and for more ample details the works of Wilson and Audubon may be consulted.

A second species is the *Trochilus Ricordi*, from Cuba.

Genus ORNISMYA, Bonap. (Lesson in part, *Hylocharis*, in part, Gray.)

To this genus belongs the *Trochilus niger* of Linnæus, which appears to be the *Tr. Vieilloti* of Shaw, the *Ornismya minima* of Lesson, and

the *Tr. humilis* of Gosse. This, if we may trust to accuracy of admeasurements, is not the *Trochilus minimus* of Swainson, or the *Least Humming-Bird* of Sloane (Hist. Jamaica), and it may be observed that, from the use of the word *minimus*, some degree of confusion has arisen. As Mr. Gosse has been the first to establish the identity of this species, distinguishing it from the *Least Humming-Bird* of Sloane, we think that the specific title of *humilis* should be adopted. At all events let the term *minimus* be abolished.

This beautiful little species, the Vervain Humming-bird, has already engaged our attention. Its description is as follows: *Trochilus humilis*, Gosse.

Male: irides, feet, and beak black; whole upper parts metallic-green; wings purplish black; tail deep black; chin and throat white, speckled with black; breast white; sides metallic-green; abdomen whitish, each feather being tipped with green; under tail-coverts, white, tipped faintly with green.

Total length, $2\frac{7}{10}$ inches; beak, $\frac{5}{10}$; tail, $\frac{8}{10}$.

Female: rather less, of a yellower-green above, which descends halfway down the tail; whole under parts pure white, unspotted, untinged with green; tail-feathers, except the two central tipped with white.

Locality: Jamaica, Domingo.

What then, it may be asked, is the *Trochilus*

minimus of Linnæus, Buffon, Edwards, and Latham, which is stated to measure only $1\frac{4}{10}$ in total length, and to which Mr. Bullock apparently alludes in the following words? "In Jamaica I procured the smallest species known, which is considerably less than some of the bees." We can only answer that we have never seen this species, but the Prince of Canino puts it into his restricted genus MELLISUGA. It is there recorded as *Trochilus minimus*, Swains. ex Linn. *Least Humming-bird*, Sloane, Jamaica, t. 264. i. Edwards's Birds, t. 105? Brisson, Ornith. iii. t. 36. i. From the Antilles. In its colouring it resembles the Vervain Humming-bird. We may here remark, that Sloane describes his *Least Humming-bird* as about $1\frac{1}{4}$ inch long, from the end of the bill to that of the tail; while in his figure the bill alone measures $\frac{3}{4}$ of an inch, and the whole bird $2\frac{5}{8}$. Now, with this fact before us, can we trust to vague admeasurements, to vague observations, and after all may not Gosse's Vervain Humming-bird, and Sloane's Least Humming-bird, be identical?

Genus SELASPHORUS, Swainson.

A splendid group, in which the gorget consists of large scaly feathers, of intense metallic lustre. The beak is fine and straight; the tail feathers are narrow, and the wings delicate. These birds are *Les Rubis* of Lesson.

As examples we may refer to the Nootka

Sound Humming-bird, *Trochilus ruber*, Linn. *Tr. rufus*, Gmel. described and figured in the Naturalist's Lib. Ornith. vol. ii. p. 71, pl. 11, the *Trochilus Anna* of Lesson, described and figured in the same work, vol. i. p. 93, pl. 6; the *Trochilus platycercus* of Swainson, *Ornismya tricolor* of Lesson, described and figured in the same, vol. ii. p. 77, pl. 13. All in Gould's cabinet. A fourth species from California has been added by M. Bourcier; it is the *Trochilus Costæ*, 1839, Rev. Zool.

Genus SEPHANOIDES, Less.

Of this genus the type is *Trochilus Galerita*, Molina, *Trochilus Kingii*, Vigors, in Zool. Journal, the Violet-crowned Humming-bird. It is described and figured in the Naturalist's Lib. Ornith. vol. i. p. 106, pl. 12. We have already alluded to it, under the title of *Mellisuga Kingii*, in an extract from Mr. Barrow's Journal. Mr. Brydges in his Notes (Proceeds. Zool. Soc. 1843,) says, respecting this species, "Found about Valparaiso in abundance in the months of August, September and October. Feeds on the *Loranthus tetrandrus*, a parasitic plant growing on the olive. It is taken by the boys with bird-lime made from the berries of the above-mentioned plant. This species of Humming-bird is seen as far south as the Island of Chiloe in lat. 42° south. The females are destitute of the flame-colour on the head, and appear to be less

numerous than the males :”—most probably because engaged in the task of incubation.

Trochilus Stokesii, King, Proceed. Zool. Soc. 1831. This magnificent species from Juan Fernandez, is described and figured in the Naturalist's Lib. Ornith. vol. ii. p. 55, p. 5.

Trochilus Fernandensis, King, Proceeds. Zool. Soc. 1831. A beautiful species, also from Juan Fernandez. Its general tint is metallic rusty-brown; the feathers on the top of the head being of a glowing scarlet. Total length 5 inches. All in Gould's cabinet.

In the genus *Sephanoides* the beak is moderate, the wings and tail ample, the feet remarkably powerful, the forehead broad and metallic.

Genus CHRYSOLAMPIS, Boié (*Les Topazes*, in part, Lesson).

This genus is represented by the Ruby-crested Humming-bird, *Trochilus moschitus*, a gorgeous species, described and figured in the Naturalist's Lib. Ornith. vol. i. p. 103, pl. 1. It is a native of the Antilles, and probably also of Guiana.

It is identical with *Trochilus Pegasus*, and *T. elatus*, Linn., also with *T. Guianensis*, and *T. Carbunculus*, Gmelin. In Gould's cabinet.

Genus ORTHORHYNCHUS, Cuvier.

Bill short and straight; head surmounted by a large loose tuft, terminating in a prolonged peak. As examples of this genus, as it is restricted by

Bonaparte, we may mention *Trochilus cristatus*, Linn., in which the crest is golden-green, blue at the tip.

Locality: Martinique, Trinidad. In Gould's cabinet.

Trochilus chlorolophus, Bonap. This species is less than the former, and its crest is altogether of a golden-green.

Locality: Martinique. In Gould's cabinet.

Genus CEPHALEPIS, Loddiges, (*Orthorhynchus*, in part, Cuvier; *Mellisuga*, in part, Gray).

This genus is so closely allied to *Orthorhynchus*, both in the form of the beak and of the beautiful crest, that we hardly know on what definite grounds it is separated; the more especially as Mr. Loddiges has not, so far as we are able to ascertain, given any precise characteristics. Referring to the Proceeds. Zool. Soc. December, 1830, we find the following passage:—"Mr. Vigors exhibited several species of Humming-birds, from the collection of Mr. John Gould; one of which, previously undescribed, had been dedicated to Mr. George Loddiges, F.L.S." &c. It approaches most nearly to the *Trochilus Lalandei*, Vieillot, but may be distinguished from that bird (in which the crest is brilliantly green, and the throat and breast rich blue) by the following characters.

Trochilus Loddigesii, Gould. Crest elongated, and of a purple lilac; throat and upper

tail-coverts, deep grey; breast and abdomen black. Locality: Rio Grande. Mr. Loddiges stated that both species (*T. Lalandei* and *Loddigesii*) belonged to a genus which he had distinguished among the *Trochilidæ* by the name of *CEPHALEPIS*, and promised to bring before the Committee at an early meeting the results of his researches on the *Trochilidæ* generally."

Trochilus Lalandii, et *versicolor*, Vieillot. De Lalande's Humming-bird. The male of this lovely species is described and figured in the Naturalist's Libr. Ornith. vol. i. p. 101, pl. 10; and the female, which is crestless, as is generally if not always the case among these male-crested species, in vol. ii. p. 59, pl. 7.

Locality: Brazil, Rio Grande.

Trochilus Loddigesii, Gould. Loddiges' Humming-bird. This beautiful bird (male) is described and figured in the Naturalist's Lib. Ornith. vol. ii. p. 5, pl. 6.

Locality: Brazil.

Genus *LOPHORNIS*, Lesson, (*Bellatrix* Boié, *Selasphorus*, in part, Swainson; *Colibri*, in part, Spix; *Mellisuga*, in part, Gray).

The birds of this genus are apparelled most splendidly, and yet the whole of their brilliant attire is so arranged, that all parts are in chaste keeping with each other.

Lesson called the birds of this section *Les Coquets*,—that is, courtiers of admiration:—he might have called them Kinglets, and with justice

for seen in a large collection of Trochilidæ we recognize in them pre-eminence of "*parure*."

The bill is short, sharp, straight, and delicate; the feathers on the sides of the neck are elongated into fan-like plumes; the head is beautifully crested; the tail moderate and rounded.

Trochilus auratus. Gm. This superb species is described and figured in the Naturalist's Lib. Ornith. vol. i. p. 112. pl. 15, male; and p. 114, pl. 16, female. The female is destitute of the full crest and long throat plumes.

Locality: Guiana, Cayenne, Brazil. In Gould's cabinet.

Trochilus magnificus, Vieill. Of this species, a young male and a female are described and figured in the Naturalist's Lib. Ornith. vol. i. p. 119 and p. 121, pls. 10 and 20. The adult male is also fully described at p. 113. In Gould's cabinet.

Trochilus Gouldi, Lesson.—Gould's Humming-bird. This most exquisite species is described in the Naturalist's Lib. Ornith. vol. ii. p. 75, pl. 12. Its snow-white throat fans, every feather being tipped with a rounded spot of emerald green, its fiery-brown crest, its scaly gorget of metallic-green, its golden-green upper surface, crossed on the lower part of the back with a white band, its narrow falcated wings, and its diminutive size, combine to throw a charm around it, fixing the gazer by a spell, which he would not willingly break.

It is but a just compliment to Mr. Gould that this bird should bear his name as its specific appellation.

The native country of this species is unknown ; we suspect it to be Brazil. The female, if in any European collection, does not appear to have been identified. In Gould's cabinet.

Trochilus (Lophornis) Audeneti, Lesson. Described and figured in the Naturalist's Lib. Ornith. vol. i. p. 115, pl. 17. In Gould's cabinet.

Trochilus (Lophornis) chalybæus, Vieill. (Vieillot's Humming-bird), described and figured in the Naturalist's Lib. Ornith. vol. i. p. 117, pl. 18. In Gould's cabinet:

Trochilus (Lophornis) Regulus, Gould, Proceeds. Zool. Soc. 1846. Feathers of the crown chestnut-brown, very much lengthened, carried to a point and tipped with green ; throat and breast luminous green ; the feathers on the side of the neck elongated, but not to so great an extent as in *Trochilus magnificus* ; back and abdomen green, with bronze reflexions ; rump crossed by a band of white ; tail chestnut-brown, each feather margined externally with bronzy-green ; wings purplish brown ; bill light brown, darker at the tip. Total length, $3\frac{1}{2}$ inches ; bill, $\frac{5}{8}$; tail, $1\frac{1}{4}$. This is a description of the male in full plumage.

Locality : Interior of Brazil. In Gould's cabinet.

Trochilus (Lophornis) Reginae, Gould, Proceeds.

Zool. Soc. 1847. Crown of the head and crest bright rusty-red, each feather with a beautiful dark green spot at the tip; throat and sides of the neck resplendent metallic-green, beneath which is a patch of white lanceolate feathers; back of the neck and upper part of the back lustrous-green; lower part and upper tail-coverts bronzy-brown; rump crossed by a distinct line of white; tail chestnut brown; the tips and margins of the two middle, and the margins of the external feathers rich bronzy-green; abdomen light metallic-green; wings purplish-brown; bill, reddish brown at the base, dark brown at the tip; feet brown.

Length, $2\frac{3}{4}$ inches; bill, $\frac{1}{2}$; tail, $1\frac{1}{8}$. In Gould's cabinet.

This species, Mr. Gould observes, is nearly allied to *Lophornis Regulus*, and *L. auratus* (*Tr. ornatus*, Bodd.) but it differs from the former in having the crest-feathers broader, and the green spots on the tips much larger. It is a very beautiful species.

How far the last four species are truly distinct from each other, may admit of a doubt, at all events the members of this genus require rigid analysis.

What, it may be asked, is the use of the throat-fans, which, in some species of this genus, are developed to such an extraordinary degree, spreading out so as to hide the bird if viewed in full front? It is only a part of that '*parure*' which

nature delights to bestow on the males of her gorgeous forms. During flight they lie flat, so as not to interfere with aerial progression; but during excitement they are raised and expanded, so as to set off the bird to the greatest advantage—even, as under similar circumstances, the peacock raises its upper tail-coverts, attracting admiration.

Genus DISCOSURA, Bonaparte, (*Platurus*, in part, Lesson; *Mellisuga*, in part, Gray).

In this genus the tail is deeply bifurcated, the shafts of the outer tail-feathers becoming attenuated, and ending in a spatulate or racket-like disc. So far, it agrees with the genus *Spathura*, Gould, but it is at once to be distinguished by the tarsi being destitute of downy muffs.

Trochilus longicaudatus, Gmelin. (*Trochilus platurus*, Latham). The Racket-tailed Humming-bird. This species is described in the Naturalist's Lib. Ornith. vol. ii. p. 111.

Locality: Guiana. In Gould's cabinet.

Trochilus ligonicaudus, Gould in Proceeds. Zool. Soc. 1846. Face and forepart of the neck green, which colour is continued on the chest, where the feathers become larger, longer and more luminous; some of these are edged with grey; centre of the abdomen golden-brown; lower part of the abdomen and under tail-coverts buffy-brown; wings purplish black; back and

upper tail-coverts green ; the rump crossed by a band of buffy-white ; tail purplish-brown, with a broad stripe of buff down the centre ; the lateral tail feathers tapering and terminating in a large spatulate tip ; bill black.

Total length, $4\frac{1}{2}$ inches ; bill, $\frac{5}{8}$; tail, $2\frac{1}{4}$.

Locality : Brazil. In Gould's cabinet.

Genus *TRYPHÆNA*, Gould.

In this genus the males and females differ considerably in plumage. The male has the tail greatly forked, and in some species the outer tail-feather on each side is incised near the tip, which tip expands almost racket-like ; the gorget is ample, the beak long, and nearly straight ; the wings rather small. In the female the tail is even.

The typical form of this genus, is *Tryphæna Duponti* (*Trochilus Dupontii*, Lesson.) This species is described and figured in the Naturalist's Lib. Ornith. vol. i. p. 131, pl. 26.

Locality : Mexico, Guatemala.

Trochilus amethystinus, Gmelin. This species is described as the Amethystine Humming-bird in the Naturalist's Lib. Ornith. vol. ii. p. 64, pl. 9.

Trochilus amethystoides, Less. This species is described as the Little Amethystine Humming-bird in the Naturalist's Lib. Ornith. vol. ii. p. 62. Locality : Brazil. May not this species be a variety of the preceding ? Lesson

figures a species under the title of *Trochilus orthura*, described in the Naturalist's Lib. Ornith. vol. ii. p. 60, pl. 8, as the "Even-tailed Amethystine Humming-bird." It appears to us to be the female of *Tr. amethystinus*, or perhaps even of *Duponti*. We suspect that on revision the genus *Tryphæna*, as it stands at present, will require some modification. All the species in Gould's cabinet.

Genus AUGASTES, Gould.

Male and female beautiful. Beak straight and rather short; wings moderate; tail even.

Gorget splendid, ending in a free pendent point. There is a brilliant forehead-spot in the males; the chest, below the gorget, is ornamented by two buff crescentic marks meeting each other at the median line, one being on each side of the chest.

Trochilus superbus, Vieill. (*Tr. scutatus* Temm.) This superb species is described and figured in the Naturalist's Lib. vol. i. p. 110, pl. 14, under the title of Natterer's Humming-bird.

Locality: Brazil. In Gould's cabinet.

Trochilus Lamachellus, Lesson. (*Augastes Lamachellus*, Gould.)

This is a most gorgeous species. The head is velvet-black, whence a black mark descends incircling the gorget, with a border of intense ruby feathers below, forming a sort of necklace.

The forehead and gorget are changeable emerald and bronze, of effulgent lustre. The under surface of the tail glistens with a golden radiance ; upper and under surface bronzy green.

The female wants the black on the top of the head ; the side line of the gorget is dusky.

Locality : Brazil. Bahia. In Gould's cabinet.

Genus CALOTHORAX, Gray. (*Les Lucifers*, Lesson.)

In this genus the beak is long, slender, and gently arched ; the wings are moderate ; the tail is singularly bifid in the male ; the outer tail-feather on each side is short and slender, the two next much longer and pointed, and the central much shorter ; the gorget is ample, magnificent, free, and pointed at the sides.

The female is plain, without a distinct gorget ; the tail is rounded, its outer feathers being tipped with white or brown.

To this genus belongs the *Trochilus Lucifer*, Swainson. (*Ornismya Cyanopogon*, Lesson), described and figured in the Naturalist's Library, as the Blue-throated Humming-bird, vol. ii. p. 79, pl. 14. In Gould's cabinet.

Another, but abnormal species, perhaps to be transferred to the genus *Tryphæna*, is the *Trochilus enicurus* of Vieillot. This bird is described and figured in the Naturalist's Lib. Ornith. vol. i. p. 133, pl. 27. It is certainly not one of the genus *Calothorax*. In Gould's cabinet.

Trochilus Calliope, Gould in Proceeds. Zool. Soc. 1847.

Upper surface green ; wings and tail, greyish-brown ; feathers of the throat elongated, narrow, and of a rich pinky scarlet, with white bases, arranged in a star form ; breast, centre of the abdomen, and under tail-coverts, white ; flanks, buffy-white ; bill and feet, blackish brown.

Total length, $2\frac{1}{2}$ inches ; bill, $\frac{5}{8}$; tail, 1. In Gould's cabinet.

This is a very diminutive species, much smaller than *Tr. Lucifer* (*O. Cyanopogon*), but of precisely the same form.

Locality : Mexico.

At the end of his list of the species of the genus *Calothorax*, the Prince of Canino notices *Ornismya Elisa*, Lesson, 1839 ; and *Trochilus Yarrelli*, and *Tr. Evelynæ*, of Bourcier, in Proceeds. Zool. Soc. 1847, with a query as to their true characters and generic rank. These two last species are in the cabinet of Mr. Loddiges, but, as far as our judgment is concerned, will not come under the present genus.

The *Trochilus Yarrelli* is thus described.—Adult male : beak black, straight, cylindrical ; head round ; the upper part of the body entirely grey, with a slight reflexion of glossy yellowish-green ; throat and gorget of a brilliant greenish-blue, passing into violet in the centre ; sides of the neck, breast, and abdomen whitish ; under tail-coverts long and white ; quill-feathers short,

and of a light grey; tail light grey; the three outer feathers very narrow, elongated, and curved like the blade of a scimeter; the intermediate feathers are shorter and rounded, and slightly tinged with gold; feet black.

The female resembles the male, excepting that she is destitute of the splendid gorget; the narrow tail-feathers are grey at their base, black in the centre, and white at the extremity.

Locality: Monté Video.

Bourcier considers this species allied to the Cora Humming-bird, Nat. Lib. Ornith. vol. i. p. 129, pl. 25.

Trochilus Evelynæ. Adult male: beak slender, black, straight, cylindrical; head round; all the upper parts of the body, glossy brownish golden-green; throat and scaly gorget of a brilliant violet-red; feathers of the sides of the neck and chest silky and whitish; abdomen yellowish-red; wings narrow, the quill-feathers blackish-grey, with a tinge of violet; tail-feathers narrow, elongated, and acuminate; the outer feather is black with violet reflexions; the next violet-black at its extremity, with the inner vane of a bright orange-red; the third of an orange-red has only the outer vane black, along its apical half; the fourth is almost entirely violet-black, its outer vane being orange only at the base; the middle tail-feathers are rudimentary.

Locality: New Providence.

Allied to *Trochilus* (*Ornismya*) *Elisa* of Lesson.

Genus HELIACTIN, Boié. (*Les Queues étroites*, Lesson, *Cynanthus*, in part, Swainson).

In this genus the beak is rather short and spiny. In the male the head is ornamented with a long aurifulent crest overhanging the eyes and ears; the throat is adorned with a dusky black gorget, free, and pointed, drooping on the chest; the tail is graduated, and consists of long narrow pointed feathers, all white, except the two central.

The female wants the splendid head-crest, but is otherwise very beautiful.

One species only is as yet recorded, viz. *Trochilus cornutus*, described and figured, male and female, in the Naturalist's Lib. Ornith. vol. i. p. 122, pl. 21; p. 124, pl. 22.

Locality: Brazil.

Genus THAUMASTURA, Bonaparte, (*Calothorax* and *Mellisuga*, in part, Gray)

The type of this genus is the *Trochilus Cora* of Lesson, described as the Cora Humming-bird in the Naturalist's Lib. Ornith. vol. i. p. 129, pl. 25. It is remarkable for the graduation of the tail, and the length of the two central tail-feathers.

Locality: Peru. In Gould's cabinet.

The Prince of Canino places within this genus the *Trochilus Vesper* of Lesson, but it is not strictly typical. It is described as the Evening

General William H. Hall, (La. 1863-1864)
and General H. H. Hall, (La. 1864-1865)

The book is rather short and
the material is arranged
in a way which is very
convenient for reference.
The book is well bound, and
the paper is of a good quality.
The book is a very good one
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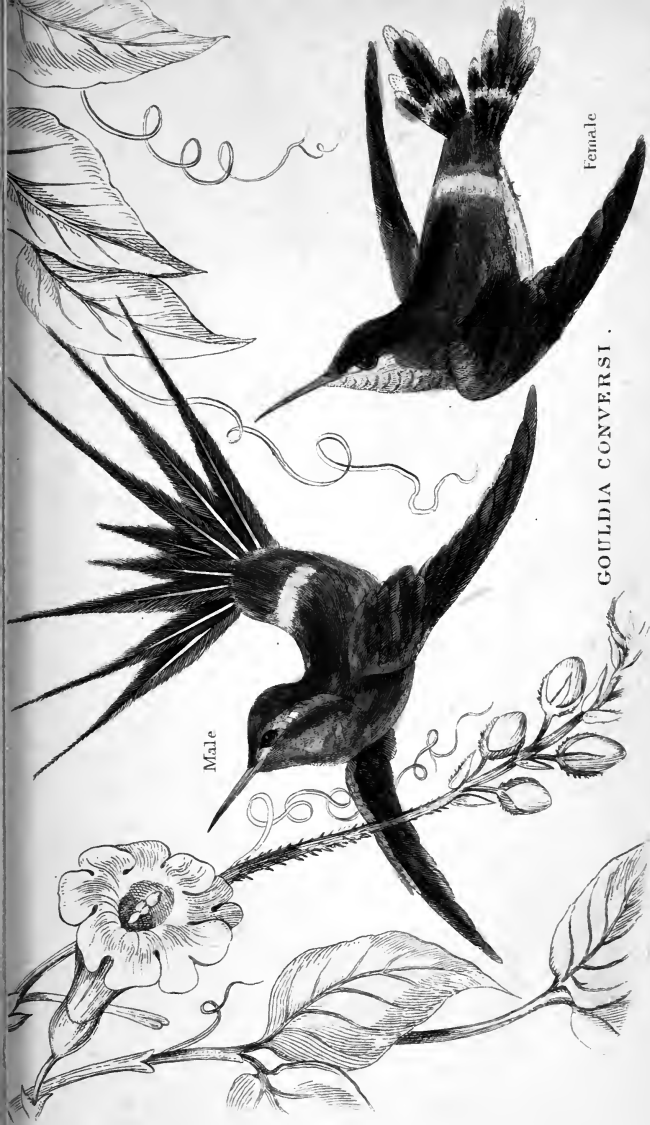
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Male

Female

GOULDIA CONVERSI.



Humming-bird, in the Naturalist's Lib. Ornith. vol. i. p. 127, pl. 24.

Locality: Chili. In Gould's cabinet.

An allied species, *Ornismya Fanny*, Lesson, (*Trochilus Labrador*, Bourcier,) is found in Peru.

Genus GOULDIA, Bonaparte, (*Mellisuga*, in part, Gray).

In this genus the beak is short; the wings small; the gorget green; the tail-feathers are very singular; the outermost on each side is long, setaceous and pointed; the rest, with the same character, decrease in length, till the central are short and often concealed by the upper tail-coverts.

The typical example of this genus is represented by the *Trochilus Langsdorfi*, Vieillot, described and figured as Langsdorff's Humming-bird, in the Naturalist's Lib. Ornith. vol. ii. p. 69, pl. 10.

Locality: Brazil.

Trochilus (Gouldia) Popelairi, Dubus. Male with a long lapwing-like crest of pendant setaceous feathers; forehead and throat emerald-green; top and sides of the head bronzy; chest dusky-black, paler below; thighs rufous; wings moderate; two central tail-feathers short, the rest longer and longer, ending in sharp prolongations, these feathers are of a steel-blue, with white shafts; a white bar across the rump, wings minute. The female is plain, of a bronzy tint, with a white bar across the rump; the tail

is short, dusky, and but little forked, when closed it might even be called rounded.

Locality: Columbia. In Gould's cabinet.

Trochilus (Gouldia) Conversi, Bourcier, 1846.
Plate XIV.

Male: green, with a white rump-bar; tail-feathers long, narrow, pointed, glossy black, with white shafts. The female differs greatly from the male; the tail is forked, but is composed of rounded feathers, of which the third on each side is the longest; each feather is dusky at the base and tip, the latter shewing a spot of white; head and throat dusky; general plumage green, with a white rump-mark.

Locality: Santa Fé de Bogotá. In Gould's cabinet.

These birds appear to be swallow-like in their mode of flight, capturing insects on the wing. It was from this circumstance, we believe, that Spix applied the title of *Colubri hirundinaceus*, to the *Trochilus Langsdorfi* of Vieillot, described and figured in *Aves Brasil*, tab. 8, 2.

Here we conclude our list of Genera, having selected in illustration of each some of the most typical species which Mr. Gould's magnificent cabinet contains.

We have given preference to those that are rare, and have been only recently described. Not unfrequently we have had occasion to revert to the Naturalist's Library of Ornithology, the spe-

cimens therein described being before us ; but, excepting in two instances, for reasons assigned, we have forborne any thing beyond a mere citation of them as examples in point ; unless, indeed, when in our general survey, we have been able to add something to the knowledge of their habits and economy.

In our arrangement of the Genera we have followed the Prince of Canino, (Ch. L. Bonaparte,) in his "*Conspectus Generum Avium*." Up to the present time this arrangement is the most complete and perfect which has as yet been laid before the scientific world. That it will require many modifications, many alterations, and many additions, cannot be denied ; and it is equally clear that some transposition of generic terms has been already effected ; and this very fact leads us to the premises with which we commenced, namely, that the history of the Humming-birds is now only beginning to open before us. Thus, then, (to repeat our own words,) although 300 species are now Cabinet-contained, our knowledge of this group is very far from being complete ; we are slow in obtaining a full grasp of the subject, and years may pass over before that grasp is ample.

A vast stride, however, is made in the right direction, and should another edition of this unpretending volume be hereafter required, we hope to be able to enrich it with novel and interesting matter.

We have quoted largely from several authorities ; but to whom are we to look for information, if not to those who have enjoyed the opportunity of observing these birds in their native localities, and who, by direct experiments, have tested their power of endurance in a state of imprisonment ? We owe them a debt of gratitude, and respectfully acknowledge the benefit to the science of this department of Ornithology which has accrued from their labours.

To Mr. Gould our thanks are due for the full and free use permitted to us of the specimens in his noble Cabinet, without access to which (not as an ordinary observer having no especial purpose), the present addition to the "Natural History of Humming-birds" must have been far more meagre, and less popular, than we hope our readers will consider it to be.

We shall only add that we trust in the favourable reception of a little work bearing upon a subject which is now attracting general attention, and which may be regarded as the avant-courier of the grandest monograph of the *Trochilidæ* which has ever been laid before the scientific public,—*un ouvrage du luxe*, fitted expressly to grace the libraries of the opulent.



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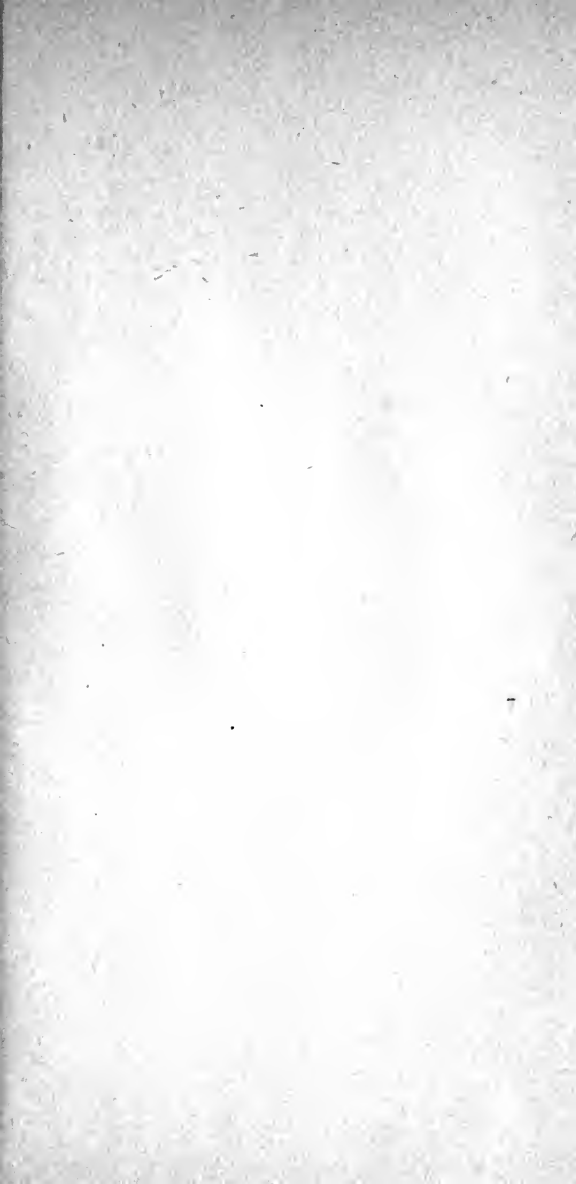
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Author	Title	Year	Price	Notes
Abraham Lincoln	Emancipation Proclamation	1863	1.00	
Abraham Lincoln	Gettysburg Address	1863	0.50	
Abraham Lincoln	Second Inaugural Address	1865	0.50	
Abraham Lincoln	Speech on the State of the Union	1861	0.50	
Abraham Lincoln	Speech on the State of the Union	1862	0.50	
Abraham Lincoln	Speech on the State of the Union	1863	0.50	
Abraham Lincoln	Speech on the State of the Union	1864	0.50	
Abraham Lincoln	Speech on the State of the Union	1865	0.50	
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